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Coronado Expedition

National Trail Study/ Environmental Assessment

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CORONADO EXPEDITION
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UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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SUMMARY

At the request of Congress, the National Park Service has studied the U.S. portion of the historic route of Francisco Vázquez de Coronado for possible inclusion in the National Trails System. In 1540–42, Coronado led the first fully documented European undertaking to explore what would later form the greater United States Southwest. The historically significant expedition traveled through the five present-day states of Arizona, New Mexico, Texas, Oklahoma, and Kansas—a journey of approximately 1,400 miles. The expedition was of major significance to American Indian and European peoples and cultures. For the Europeans, the expedition contributed information about previously unknown American Indian cultures, geographic data on North America, and descriptions of North American flora and fauna. For the Indians, it marked the beginning of an invasion and conquest of their lands. Their lives, religion, and culture were forever changed. The story of the expedition and its results is one of triumph and tragedy, and it was significant as a seminal event in shaping the multicultural development of the area through which it passed.

After extensive historical and archeological research and a series of public scoping meetings, a draft trail study report was prepared. After a public comment period, revisions were made to produce this final report, which presents the results of an analysis of the eligibility of the route taken by Coronado as a national historic or national scenic trail. The route was evaluated in accordance with criteria set forth in the National Trails System Act of 1968, as amended, for national historic trail designation. Because the act contains minimal criteria for evaluating national scenic trail designation, a set of criteria was developed (based on the act) and approved by the secretaries of the interior and agriculture in 1969. The "National Trail Eligibility" section of this document provides a complete list of the criteria for both national historic and national scenic trail designation and an analysis of the Coronado route relative to each criterion.

As determined through the analysis, which is summarized in this document, the Coronado expedition route does not meet the criteria required for national historic or scenic trail designation. However, because the expedition is of national and international significance, other options for commemorating the expedition should be considered.

Five alternatives were developed to present distinct options to the public and Congress, but elements from various options could be combined. Federal agency participation varies in the alternatives from a major role to no federal involvement. On the basis of this document and the public response, Congress may choose to enact legislation to implement one or more of the alternatives or a combination of the alternatives, or to take no action. The five alternatives discussed and analyzed in this study are summarized below. No alternative is identified as preferred over the others.

Alternative A: Coronado Expedition Research Commission – Congress would establish a commission composed of experts in fields such as archeology, history, ethnography, and cultural geography. Its purpose would be to coordinate, analyze, synthesize, and publish additional in-depth research to identify the route of Coronado and his army as accurately as possible. The commission also would coordinate a limited public education and interpretive program on a partnership basis with state, local, tribal and private entities. The commission would be required to complete its research in five

years. On the basis of the additional research, a reevaluation of the national historic trail eligibility could be undertaken.

Alternative B: National Heritage Corridor – Established by Congress, the national corridor would preserve and interpret significant cultural and national resources and sites in a broad area. A network of roads would be identified to connect several existing and future commemorative and archeological sites associated with the Coronado expedition and related resources. The development of extensive partnerships with other federal, state, and local programs and grass roots initiatives would be necessary to protect and interpret these sites. Federal involvement would be limited.

Alternative C: Increased NPS Interpretation and Commemoration – Interpretation would be enhanced at existing national park system units and related sites to tell a more complete story of the Coronado expedition. Coronado National Memorial staff would have a major role in coordinating this comprehensive interpretive program. The potential for adding a new unit or units to the system could be explored to more fully commemorate and interpret the expedition and its effects on 16th century American Indian cultures.

Alternative D: State-Coordinated Commemoration – The five states would develop a program of coordinated commemoration and interpretation of the Coronado expedition. A symbolic route would be identified and marked, The route marked would be one that generally parallels the corridor thought to have been traveled by Coronado and that provides access to and interpretation of related 16th century Indian sites. The federal government's role would be limited; a separate agency, commission, or private group would coordinate activities.

Alternative E: No Action – Existing commemorative and interpretive programs and those planned by others would continue to be implemented. No additional efforts to commemorate the Coronado expedition would be taken by Congress or the National Park Service except as part of other existing or future programs, when appropriate.

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INTRODUCTION

STUDY PURPOSE

In 1988, Congress directed the secretary of the interior to study the U.S. portion of the historic route of Francisco Vázquez de Coronado for potential inclusion as a component of the National Trails System (see legislation in appendix A). A national trail study assesses the eligibility and, if eligible, the feasibility and desirability of authorizing a route, which in this case includes a swath of approximately 1,400 miles through Arizona, New Mexico, Texas, Oklahoma, and Kansas, as a national historic or scenic trail. The study has been carried out by an interdisciplinary team with representatives from the National Park Service's Denver Service Center and Southwest Regional Office in Santa Fe, assisted by personnel from the Western and Midwest regional offices.

This document, a report on the results of the study, also contains alternatives to national trail authorization. The alternatives offer other ways in which the Coronado expedition could be commemorated. The document was prepared on the basis of extensive history and archeology research and input received at a series of public scoping meetings. The draft study report was available for public review during a 60-day period in August and September 1991. The document does not contain a proposal for a national trail, nor does it include a recommendation to implement any alternative. The National Park Service has consulted with state historic preservation officers during preparation of the study.

This document includes a general environmental assessment prepared in compliance with the National Environmental Policy Act, which contains analysis of the environmental effects of the conceptual alternatives described below. More detailed environmental analyses will be completed if Congress directs that one of the alternatives be implemented.

NATIONAL TRAILS SYSTEM

The National Trails System Act of 1968, as amended, institutes a national system of recreation, scenic, and historic trails. National **recreation** trails provide a variety of outdoor recreation uses in or reasonably accessible to urban areas. They are designated by the secretary of the interior or the secretary of agriculture. National **scenic** trails are extended routes, authorized by Congress, that provide recreation and the conservation and enjoyment of the nationally significant scenic, natural, or cultural qualities of the areas through which they pass. Scenic trails are primarily intended for hiking and other nonmotorized uses determined to be appropriate for each individual case; for example, horseback riding, bicycling, crosscountry skiing, and nature study. Recreational use of scenic trails tends to be a more important management emphasis than natural and cultural history interpretation. Congress has established eight national scenic trails: the Appalachian, Pacific Crest, Continental Divide, North Country, Ice Age, Potomac Heritage, Natchez Trace, and Florida trails.

National **historic** trails are extended routes, authorized by Congress, that follow nationally significant original routes of travel as closely as possible. Their purpose is to identify and protect the historic route and its remnants and artifacts for public use and enjoyment. Congress has established nine national historic trails: the Lewis and Clark, Oregon, Mormon,

Iditarod, Overmountain Victory, Trail of Tears, Nez Perce, Santa Fe, and Juan Bautista de Anza trails. To qualify as a national historic trail, the trail must, among other things, meet three special criteria in the National Trail Systems Act: (1) It must be a trail or route established by historic use, its location must be sufficiently known, and it should generally follow the historic route accurately; (2) it must be of national significance with respect to any of several broad facets of American history; and (3) it must have significant potential for public recreational use or historic interest based on historic interpretation and appreciation. If Congress authorizes a national historic or scenic trail, a management plan is developed to define the designated route more accurately and to specify actions necessary to provide for public use and resource protection.

The National Trails System depends on grass-roots public support to protect, interpret, acquire, develop, and maintain the trails. Unlike national recreation trails, national scenic trails and national historic trails include an ongoing federal administrative responsibility. The role of the federal agency with primary responsibility for administering a trail is one of coordinating and stimulating efforts of other federal agencies, state and local governments, private organizations, and individuals. Other than administrative costs, federal spending on such trails will usually consist of limited financial assistance on a cost-share basis to locally initiated projects. Local volunteer time and labor for trail-related activities, such as on-the-ground trail building for scenic trails, is essential. The administering agency also can provide technical assistance on a broad range of trail-related actions, including acquisition, development, protection, resource management, interpretation, and maintenance.

National Trails System

Coronado Expedition, National Trail Study

United States Department of the Interior • National Park Service
DSC/JAN 91/NTCOR/40000

NOT TO SCALE

THE CORONADO EXPEDITION

DESCRIPTION

Long before Englishmen landed on the shores of Virginia and the rocky littoral of Plymouth, Spanish explorers had already traversed the Atlantic coast from Labrador to the Strait of Magellan and determined the extent of North America from Florida to California. Between 1539 and 1543, three Spanish expeditions explored the interior and west coast of the present United States. These expeditions—one led by Hernando de Soto from Florida to the Mississippi River and beyond, another by Francisco Vázquez de Coronado from the west Mexican coast to central Kansas, and the last by Juan Rodriguez Cabrillo from La Navidad on the west Mexican coast to possibly the Rogue River in Oregon, collectively allowed the Spanish to assess the size of North America and survey its plentiful natural resources. Within this vast land lived many American Indian cultural groups, which the Spanish described for the first time in print within the Eurocentric context of the period.

Francisco Vázquez de Coronado led the first fully documented European undertaking to explore what would later form the greater United States Southwest. Within 48 years after Columbus' landing, Coronado's men stood on the edge of Arizona's Grand Canyon, and visited the Indian pueblos at Zuni, Hopi, Acoma, Pecos, and the villages along the Rio Grande. They traversed a series of routes from Compostela in western Mexico through portions of the present-day states of Arizona and New Mexico. Indeed, one contingent explored westward and crossed the Colorado River into California. From New Mexico, they went east toward the Great Plains, where they explored parts of Texas and saw and described large buffalo herds. Moving north of there, the Coronado expedition crossed Oklahoma and traversed southern Kansas as far as the Great Bend of the Arkansas River before reaching Indian villages in central Kansas. Thus, the expedition became one of the epic stories of the Age of European Exploration.

To place the Coronado expedition in the context of world history, it represents a continuation of European expansion that dates from the 13th century when Marco Polo sparked the imaginations of his countrymen to develop a route to the Orient. Wars, banditry, religious animosities, and great distances did not deter Europeans from their quest to establish a trade route to the Far East, where they might obtain spices, gold, and luxury items.

Spurred by the European desire to find a route to the Orient and encouraged by knowledge as well as legends and myths from the ancient worlds of Greece and Rome, Italians, Portuguese, and Spaniards took the lead in the 15th century, exploring the Mediterranean and the Atlantic seacoast of Africa in an effort to establish a water route to Cathay (China) and Cipangu (Japan). Centuries of European exploration led to Christopher Columbus' voyage across the Atlantic. His discovery of a land mass between Europe and the Orient became an object of European curiosity and expansionist visions.

Exploration of the western hemisphere became a priority among the leading powers of Spain, France, Portugal, and England. The conquest of the Aztec kingdom by Hernando Cortés reinforced the European quest for legendary civilizations mentioned in Roman and Greek mythology. American Indian legends became intertwined with European mythology. Fabled cities of gold and silver took on Indian names like Quivira, and the story of King

Midas with his golden touch soon gave way to the legend of El Dorado. Not only did Spanish and Portuguese explorers search for them; so, too, did the French and English like Jacques Cartier and Walter Raleigh. Finally, as part of this massive effort to learn more about the Americas, the Spanish crown authorized the exploration of North America with a three-pronged effort: De Soto in Florida, Cabrillo along the California coast, and Coronado in the continent's interior.

To understand the expedition, one must look at its leader, Francisco Vázquez de Coronado. He was born in 1510 in Salamanca, Spain, to the nobleman Juan Vázquez de Coronado and Doña Isabel de Lujan. In 1512, Juan Vázquez was appointed *corregidor* (magistrate and alcalde mayor) of Burgos in northern Spain. Because of legal entanglements, the father created a *mayorazgo*, or tailed estate, in 1520, in which he assigned his estate to Gonzalo Vázquez de Coronado, Francisco's eldest brother. The *mayorazgo* prescribed that the estate would be passed down through Gonzalo's firstborn male descendants. Like Francisco, Gonzalo's younger brothers, both named Juan Vázquez de Coronado, would have to seek their own positions in life: one became an *adelantado* in Costa Rica; the other, a *comendador* of the order of St. John of the *encomienda* of Cubillas. Meanwhile, with his social fate decided by the *mayorazgo*, Francisco Vázquez de Coronado bided his time for an opportunity. In 1535, when the newly appointed viceroy to Mexico, Antonio de Mendoza, sailed from Spain to his position, he took along his court favorite, 25-year-old Francisco Vázquez de Coronado, as a member of his retinue.

With Viceroy Mendoza's political friendship and patronage, Vázquez de Coronado's prominence rose in Mexico City. By summer 1538, Francisco Vázquez, the viceroy's protege, had been appointed a member of Mexico City's city council and was made an organizer and charter member of the Brotherhood of the Blessed Sacrament for Charity, a charitable society founded to aid the needy and educate orphan girls. Soon after, he married the wealthy heiress Beatriz de Estrada, daughter of the deceased royal treasurer, Alonso de Estrada, who was rumored to be a son of the late King Ferdinand. Coronado's mother-in-law, Doña Marina, presented the newlyweds with a large country estate—half of Talpa. In addition, Vázquez had by his own right acquired the lands of Juan de Burgos, who had returned to Spain. Thus, Francisco Vázquez had, in a few short years, climbed the political and social ladder of colonial New Spain. Due to the imprisonment of Nuño de Guzman, governor of Nueva Galicia, north of Mexico City, Viceroy Mendoza appointed Vázquez de Coronado to the vacant governorship in 1539. His star appeared to be in continual ascent.

Meanwhile, Alvar Nuñez Cabeza de Vaca and his three companions, survivors of the ill-fated Panfilo de Narvaez expedition to Florida (1528), had been rescued in Sonora in 1536 and taken to Mexico City. There they reported on their shipwreck in the Gulf of Mexico and what they had seen in their eight years of wandering between the Texas coast and Sonora. Their stories inspired a series of expeditions northward, one led by Governor Francisco Vázquez de Coronado. By spring 1539, Fray Marcos de Niza and a small party composed mainly of Indian guides and Estevan Dorantes, also known as Estevan the Moor, began traveling north on an exploring venture to verify stories about possible rich civilizations such as Quivira and Topira. In autumn 1539, Niza returned with news of Estevan's death. His accounts about Cibola, which he may or may not have seen first-hand, were carefully written and do not seem particularly misleading. He described the first of the Zuni villages in superlative terms and style:

> I proceeded on my journey until coming within sight of Cibola, which is situated on a plain at the base of a round hill.
>
> The pueblo has a fine appearance, the best I have seen in these regions. The houses are as they had been described to me by the Indians, all of stone with terraces and flat roofs, as it seemed to me from a hill where I stood to view it. The city is larger than the city of Mexico.
>
> When I told the chieftains who were with me how well impressed I was with Cibola, they told me that it was the smallest of seven cities, and that Totonteac is much larger and better than all seven. That it has so many houses and people that there is no end to it.

Little in this writing suggests a city of gold; however, Niza's oral report apparently was a different story. Viceroy Mendoza, confident of the existence of "another Mexico," ordered that a large expedition be organized to explore and verify the existence of the "Seven Cities of Gold" in the kingdom of Quivira, possibly just beyond Cibola. Because of his rivalry with Hernando Cortés, who had petitioned to lead the expedition, Viceroy Mendoza was anxious to appoint one of his own trusted followers. For that reason, he selected Francisco Vázquez de Coronado to lead the expedition to Cibola. Royal approval of Coronado to lead the expedition arrived on January 6, 1540, as he and the viceroy proceeded to plan the expedition.

By late February 1540, Viceroy Mendoza reviewed the expedition at Compostela, south of Culiacan. More than 230 mounted men and 62 foot soldiers formed the main body of the Spanish troops, with others scheduled to join them on the way. Meanwhile, an advance guard under Melchior Diaz traveled northward to scout the trail. By the end of February the main body, with more than 800 Indian allies (the number would later grow to just over 1,000), prepared to leave Compostela for Culiacan, the next staging area. The expedition's personnel included a number of colonial and international travelers. Three Spanish women listed as wives of foot soldiers accompanied the troops. Although the muster roll does not list his name, a surgeon traveled with the expedition. Six friars, aside from Marcos de Niza, participated in the expedition. The muster roll also lists the names of five Portuguese, three Italians, three Frenchmen, a German, a Briton, and a Fleming. A sea wing of the expedition commanded by Hernando de Alarcon and consisting of two ships loaded with artillery, provisions, and munitions traveled north in the Sea of California to the mouth of the Colorado River. Other persons on the muster list may have had foreign births, but the expedition's documentation does not establish their cases.

The march from Compostela to Culiacan, the last Spanish frontier outpost in the north, took almost a month. The northward movement of the large, unwieldy expedition was slowed as it passed through thickly forested mountains while guarding against confrontations with Indian groups, who had felt the blows of the Spanish conquest. Not only did Vázquez de Coronado's men have to herd 1,000 head of horses, they had to tend to 600 pack animals and other stock that included sheep, goats, and cattle. After reaching Culiacan, Vázquez de Coronado decided to advance with approximately 75 horsemen and 25 foot soldiers, some Indian allies, and a small herd of cattle. Tristan de Luna y Arellano took charge of the main army, which advanced to Cibola at a slower pace.

Meanwhile, led by native guides and accompanied by Fray Marcos de Niza, Vázquez de Coronado and his expedition crossed one river valley after another through Sonora as they followed old Indian trails to Cibola. The traditionally accepted route is that after leaving Culiacan, the expedition passed near Pericos, an ancient settlement in country that opens into broad, flat coastal plains. North beyond Pericos, the guides led them through a series of rivers and into a narrow canyon, which they followed for some distance before reaching Corazones.

From Corazones, the expedition went northward; after reaching Chichilticalli, the fatigued men and animals rested for two days to prepare for their march through the mountainous, unpopulated country ahead. The expedition moved northward until they were a day's march from the first Zuni village. On July 6, 1540, Zuni warriors attacked an encamped advance guard of the expedition led by Garcia López de Cárdenas. The next day at Cibola (or Granada), possibly today's Hawikku, Vázquez de Coronado, believing he and his men might perish from lack of food and water, decided to attack the village. During the attack, Coronado was hit by a stone as he attempted to scale a ladder at one of the houses. Garcia López de Cárdenas came to his rescue. After the battle, the Zunis retreated, permitting the Spanish to enter. The advance guard camped there during the summer of 1540.

Cibola served as a base of operations. Coronado sent forth three small exploring parties from there, all led by Indian guides. Each reported new European discoveries: Pedro de Tovar reached Tusayan, one of the Hopi villages; Garcia López de Cárdenas reached the Grand Canyon and peered into its depths, seeing the Colorado River below; and Hernando de Alvarado reached the edge of the Great Plains after passing significant landmarks, including Acoma, Tiguex (the north valley of present-day Albuquerque), the Rio Grande, and the Galisteo and Pecos pueblos.

Sometime between September 1540 and January 1541, Tristan de Luna y Arellano brought the main force up from Corazones and rendezvoused with Vázquez de Coronado at Cibola. Coronado and a portion of his army moved toward the Rio Grande valley of New Mexico by way of the province of Tutahaco, establishing a winter camp for the expedition at Tiguex, probably near present-day Bernalillo, north of Albuquerque. The situation at Tiguex, while at first friendly, soon turned antagonistic after the natives accidentally killed some Spanish horses, and a full-scale war broke out. During the winter, the Spanish fought the Indians at several Tiguex pueblos, and the Indians fled to the mountains. Likewise, relationships of the explorers with other pueblos, namely Pecos, also soured.

In the fall of 1540, Melchior Diaz, in command of a small contingent of men at Corazones, received instructions from Vázquez de Coronado to rendezvous with Alarcon's ships in order to bring up the much-needed supplies and armaments. With 25 men, Diaz proceeded to the Gulf of California, then northward, but he was unable to rendezvous with Alarcon. Indians near there told of strange men who had buried a message under a tree, and their boats. Diaz discovered a tree with these words carved on it: "There are letters at the foot of this tree." Digging up the buried message Alarcon had left, Diaz learned that Alarcon, after waiting in vain for a period of time, had departed because the ships were rotting. Diaz and his men crossed the river on rafts and retraced their trail back to Corazones, but along the route Diaz died on January 18, 1541.

As the winter of 1541 gave way to spring, Vázquez de Coronado prepared to depart for Quivira. He proceeded to Pecos, where he made an uneasy peace before leaving for the Great Plains. The Pecos Indians offered a guide whom the Spaniards named El Turco (the Turk). El Turco, a Plains Indian, may have been instructed to lead the Spaniards as far as possible and lose them in the Great Plains, or he may have been guiding them to the large settlements along the Mississippi River. A bridge was built over a fast-flowing river before they reached the Buffalo Plains. Heading across the plains, Coronado and his army encountered barrancas (canyons) and seemingly limitless flatlands. There Coronado decided that he and 30 horsemen and a few foot soldiers would proceed to Quivira; the rest returned to the

Rio Grande valley to await further instructions. Once out of the canyons, Coronado and his "chosen" followers headed northward. In this segment of the route, the expedition crossed into Oklahoma and finally arrived at what is believed to be the Great Bend of the Arkansas River. There the Spanish executed El Turco for lying about the route and the existence of Quivira.

Coronado proceeded some distance beyond the Great Bend, possibly reaching central Kansas and the large Quiviran Indian villages near the Arkansas River before he turned back to the Rio Grande via a shorter, more direct route. After returning to Tiguex, where they spent the winter of 1541–42, he suffered a head injury while racing his horse with Captain Rodrigo de Maldonado. Apparently his saddle girth broke, and he fell face first and suffered a concussion when trampled by Maldonado's horse. Later he would report to his superiors that he had turned back because of his injuries, although his men believed he had simulated his injuries in order to force the return of the entire expedition. In 1542 the group retraced their trail back to Mexico City, where they reported to Viceroy Mendoza.

In the end, the expedition of Vázquez de Coronado had raised more questions about the north country. Its legacy is that it inspired further exploration, and eventually settlement, of the north. The epic journey led to the establishment of a Spanish route directly north from Mexico City that resulted in the development of El Camino Real, the Royal Road. (Other roads throughout the Spanish territories also were called El Camino Real, indicating that they were build by the government.) This 1,200-mile-long route later connected Mexico City in the south with Santa Fe in the north. Within 50 years of the reconnaissance made by Vázquez de Coronado, Juan de Oñate led settlers into New Mexico.

Vázquez de Coronado's entrada had great economic and political implications for the Indians he encountered. For example, when Coronado's winter camp was established at one of the Rio Grande pueblos, its owners fled to other pueblos. The Spanish pastured their livestock on the rich croplands along the Rio Grande, and demanded goods from the various pueblos to support the huge army.

Following hostilities between the Spaniards and the Indians, a number of the Indians were seized and burned alive or speared. Resisting pueblos were placed under siege, and eventually all the Tiguex pueblos were burned. Their occupants fled to the mountains, spending the winter there. Attempting to resettle the area during the summer of 1541, the Indians again fled when Coronado's group returned from the plains; thus, the Indians lost their food supply for the coming winter.

By 1581, when Chamuscado's expedition reached Tiguex, the area had begun to recover, but populations had declined, and Tiguex never regained its former economic and political importance.

SIGNIFICANCE

It is ironic that back in the 16th century Vázquez de Coronado was considered a failure, for in the 20th century the enormous significance of this early exploration has clearly emerged. Like other pioneering efforts, the Coronado expedition served as part of a historical process that marked the New World with its distinct culturally pluralistic character. The significance

of the expedition is that, like many others of the Age of European Exploration, (a) it prepared the way for the eventual European settlement by documenting existing Indian trails that led northward from Mexico; (b) it established a documentary record from California to Kansas based on the members' reconnaissance, correspondence, reports, and accounts; (c) it contributed geographical knowledge of North America by determining the width of the continent (following the Coronado expedition, along with that of Juan Rodriguez Cabrillo and Hernando De Soto, Spanish officials estimated the width of the continent to be 3,000 miles from sea to sea in the latitude of Coronado's travels); (d) it contributed new information about American Indian cultures; and (e) it described North American flora and fauna.

The Coronado expedition was significant in the initiation of the cultural convergence between European and American Indian cultures in the Southwest and the Plains. American Indian groups adopted new ideas and material goods, and the Spanish and later explorers and settlers learned much from the natives in many areas, such as new foods, hunting and survival techniques, and agriculture. The Coronado expedition marked the first time the modern horse walked across the plains. Adopted later by the Plains Indians, this animal revolutionized hunting, travel, and war for these nomadic tribes. For the Indians, the Coronado entrada marked the beginning of an invasion and conquest of their lands. Their lives, religion, and culture would be forever changed. Battles such as those at Zuni and Tiguex were significant as the start of international warfare and conquest. The story of the expedition and its results is one of triumph and tragedy, and it was significant as a seminal event in shaping the multicultural development of the area through which it passed.

SUMMARY OF HISTORICAL RESEARCH

At the beginning of this study, the National Park Service conducted historical and archeological archival research of Vázquez de Coronado's route. Spanish colonial archives and library collections in Spain, Mexico, and the United States were researched for new primary sources related to the expedition's personnel, route, and material culture. New transcriptions and translations were made of some of the early documents, and errors in previous translations were noted in an effort to reconcile the scanty, vague, and sometimes contradictory information in existing documents.

A bibliographic analysis of place names related to the expedition was compiled (NPS 1990a), and a historical dictionary of place names associated with the expedition was developed (NPS 1990b). Despite these comprehensive efforts, no startling new information that would aid in geographically locating the route emerged from the history research.

Published ethnographic data relating to the entrada are also meager and inconclusive. Many American Indian groups encountered by Coronado's expedition have emigrated from one locale to another, or were decimated by disease. Villages were abandoned and new ones built, place names were changed or forgotten, and the Spanish tribal designations are no longer viable. Scholars do not agree on the names or cultures of the groups encountered by the expedition.

Research was conducted in major libraries across the Southwest to collate secondary sources that describe and evaluate potential Coronado routes (NPS 1990c). Scholars' suggestions regarding the location of the route have been based on various permutations of topography, botany, ethnohistory, archeology, place names, prehistoric Indian trails, and other factors. All these ideas were compared, analyzed, and used to identify potential routes and to focus the archeological research on the most likely of these routes.

Archeological research began with development of a "profile" of site and artifact characteristics indicative of the 1540 entrada. With the use of this profile, research was conducted in state and university files and archives to identify sites showing Spanish presence during the 16th century; American Indian sites that may have been occupied during Coronado's entrada; abandoned sites or landmarks such as Chichilticalli, mentioned in the Spanish accounts; and 16th century Spanish artifacts held by institutions and individuals. Research focused on the routes Coronado himself would have traversed in the continental United States, but not in Mexico. Several side trips were taken by Coronado's lieutenants, but the study team did not research those trips in depth because of an interpretation of the congressional intent for the study and because of time and funding constraints on completion of the extensive research work. In general, less is known about the side trips than about the main expedition.

Potential archeological sites and artifacts were mapped and used in conjunction with the Coronado narratives and various secondary sources to try to define an approximate route more clearly. Results of the NPS research, including a potential route shown on USGS topographic maps (NPS 1990c), were distributed to about 60 Coronado experts, and their comments were used in further refinement of the potential routes. This research document was revised for study team use and is on file at NPS offices (NPS 1991). Additional details on

the research undertaken for the study and an extensive bibliography can be found in that document.

Archeological research was frustrated by several factors: with the exception of winters spent in the Rio Grande valley, the Coronado expedition spent little time in any one area. These explorers brought only necessities, procuring much of their food, clothing, and forage along the route. Thus, few material traces of their passing were left behind. Other 16th century Spanish activities have obscured the archeological record of Coronado's time, and past archeological work has focused on prehistoric or Spanish Colonial period sites.

In most cases, archeological site and artifact evidence is very general and does not provide the specific detail needed to identify metal, beads, glass, ceramics, or other artifacts that may have been left behind by Coronado's expedition. Too often, 16th century artifacts lack provenance that would tie them to a specific site on the ground or to a particular group.

Although there is no incontrovertible archeological evidence of Coronado's entrada in the present-day United States, several levels of confidence can be identified for these historical and archeological data. When 16th century artifacts like glass beads and crossbow bolts from Zuni and Pecos are examined within the historical context of the expedition narratives and ethnographic accounts by Zuni people, scholars agree that Coronado's expedition visited these areas. Combined archeological and historical evidence also strongly suggests that site(s) near Bernalillo, New Mexico, represent Coronado's winter encampment(s). Historical descriptions of the Quiviran villages are mirrored in the archeological remains at Great Bend Aspect sites in Kansas. These prehistoric sites also clearly show evidence of Spanish presence and of continuing trade and contact with the Pecos, New Mexico, area consistent with the narratives.

Topographic and cultural features and groups mentioned by the Spaniards provide another level of information. No archeological evidence of Coronado's entrada has been found at Acoma, but Spanish descriptions of the great rock Acuco, with villages atop its almost inaccessible cliffs, leave no doubt that the Spaniards visited that pueblo. The narratives also indicate that Coronado and his group explored the Rio Grande from perhaps the Socorro area northward to Taos, and they describe pueblos in what is probably the Galisteo Basin and along some of the tributaries of the Rio Grande. It is fairly well agreed that Coronado's party marched along a portion of the Arkansas River in Kansas.

Definition of other features and the routes between the sites is much less clear. Because of ambiguities and gaps in the narratives, few scholars are agreed on the route through Arizona, Texas, or eastern New Mexico. Data on the route through Oklahoma and northeastern New Mexico are lacking. Arguments for routes in these areas and between key sites in New Mexico are based on a number of variables, including specific geographic features (barrancas like those of Colima); fauna and flora; presence of aboriginal trails and the use of Indian guides; topographic limitations (e.g., caprock, steep canyons, malpais); measurements of time, distance, and direction described in the narratives; ease of travel for a mounted army driving livestock; the presence of wood, water, and forage; and descriptions of American Indian groups.

From these data it appears that upon leaving the Zuni pueblos, Coronado went across country in a southeasterly direction, reaching the Rio Grande somewhere in the vicinity of

Socorro, New Mexico. From the Zuni area, the army went the "direct" route in a generally eastward direction through pine and juniper country, visiting Acoma en route to their winter camp on the Rio Grande. However, it is not clear whether the army went by the cliffs and ruins of El Morro, if they went through Zuni Pass or around the south end of the Zuni Mountains, whether they skirted the malpais to the north or the south. Some would argue that they took the old Zuni-Acoma Trail across the malpais; others insist this would be impossible for a mounted army driving livestock. Only a few drainages lead into the towering mesas east of the malpais; the route through or around these areas is arguable. The narratives do not make it clear whether the army went due east from Acoma to the Rio Grande valley or cut northeastward to the vicinity of Bernalillo. It appears that the Spaniards encountered barrancas in northern Texas, probably in the Palo Duro Canyon and/or Canadian River systems.

In conclusion, with the exception of some relatively short pieces of the route in New Mexico and Kansas, the historical, ethnographic, and archeological evidence is at present too fragmentary and vague to confidently identify Coronado's route between known sites. The Study Area map displays a zone of uncertainty over much of the route. The narrow sections indicate zones where the route is more accurately defined and agreed upon. The zone reflects a range of possibilities for interpreting the evidence and a lack of agreement among recognized experts on the corridor for the Coronado expedition. Within the zone can be found the line of march followed by Coronado and his army. Sometimes these groups traveled together; at other times they followed different routes. An even broader array of possible routes, as suggested by several scholars, is displayed on a series of maps in appendix B. Conclusions drawn in this document are based on the array of routes and the zone of uncertainty and on the inability to define a more precise route that is agreed upon by the many scholars in the field, not on the route that was included in the history research study submitted for scholarly review.

DESCRIPTION OF THE STUDY AREA

NATURAL RESOURCES

While the exact route followed by Vázquez de Coronado's expedition is unknown, it is generally accepted that the conquistadors traveled through what is now Arizona, New Mexico, Texas, Oklahoma, and Kansas, a journey of some 1,400 miles. This is a region of contrasts—deserts, mountains, and open flat plains. It contains some of the least populated and developed territory in the United States. Along the Rio Grande and Arkansas rivers, present-day highways or railroads probably parallel or approximate the route, but generally much of the area thought to have been explored by Coronado is accessible only on foot or horseback, by aircraft, or on low-standard roads.

Physical Environment

The Coronado study route crosses five physiographic provinces of the western half of the United States: the Basin and Range province, the Colorado Plateau, the Rocky Mountains, the Great Plains, and the Central Lowlands. Southeastern Arizona's mountains and plains are part of the Basin and Range province (including the Sonoran Desert and Mexican Highland sections), which continues eastward across the continental divide into southern New Mexico beyond the Rio Grande. Faulting and uplift are responsible in large part for the formation of the province's intermittent, north-south oriented mountain ranges, which rise above desert plains. The Santa Cruz, San Pedro, Gila, and Salt rivers drain across southern Arizona as the land slopes gradually toward the Gulf of California.

Along the northern edge of the Mexican Highland section, the rugged Mogollon Rim, an expanded horseshoe-shaped mountain escarpment some 7,600 feet in elevation, forms the southern edge of the Colorado Plateau physiographic province, which includes the Grand Canyon and Datil sections. The Datil section extends from just east of Holbrook almost to the Rio Grande Valley, continuing as far north as Gallup, New Mexico. This section is composed of colorful volcanic necks, mesas, and cones in various stages of degradation and deposition; the topography is often rough and broken with broad valleys and desert plains that are largely level or gently rolling.

Northeast of the Mogollon Rim, the Little Colorado River drains the southern portion of the Navajo section of the Colorado Plateau. This vast uplifted area has gently folded or nearly horizontal strata cut through by streams. Sandstone and shale plateaus of all sizes and elevations overlook arid plains, canyons, and dry washes.

In western New Mexico, the Zuni uplift is an elongated elliptical dome that stretches some 70 miles south and east from the vicinity of Gallup. A succession of erosion valleys and low mesas, desert cliffs and long barren slopes, and the southwest-flowing Zuni River and its tributaries can be seen from this 9,200-foot-high dome.

Eastward across the continental divide, the Datil section includes 11,389-foot-high Mount Taylor and the geologically recent lava flows and cinder cones known as the *malpais*. This

National Park Service Study Area

Coronado Expedition, National Trail Study

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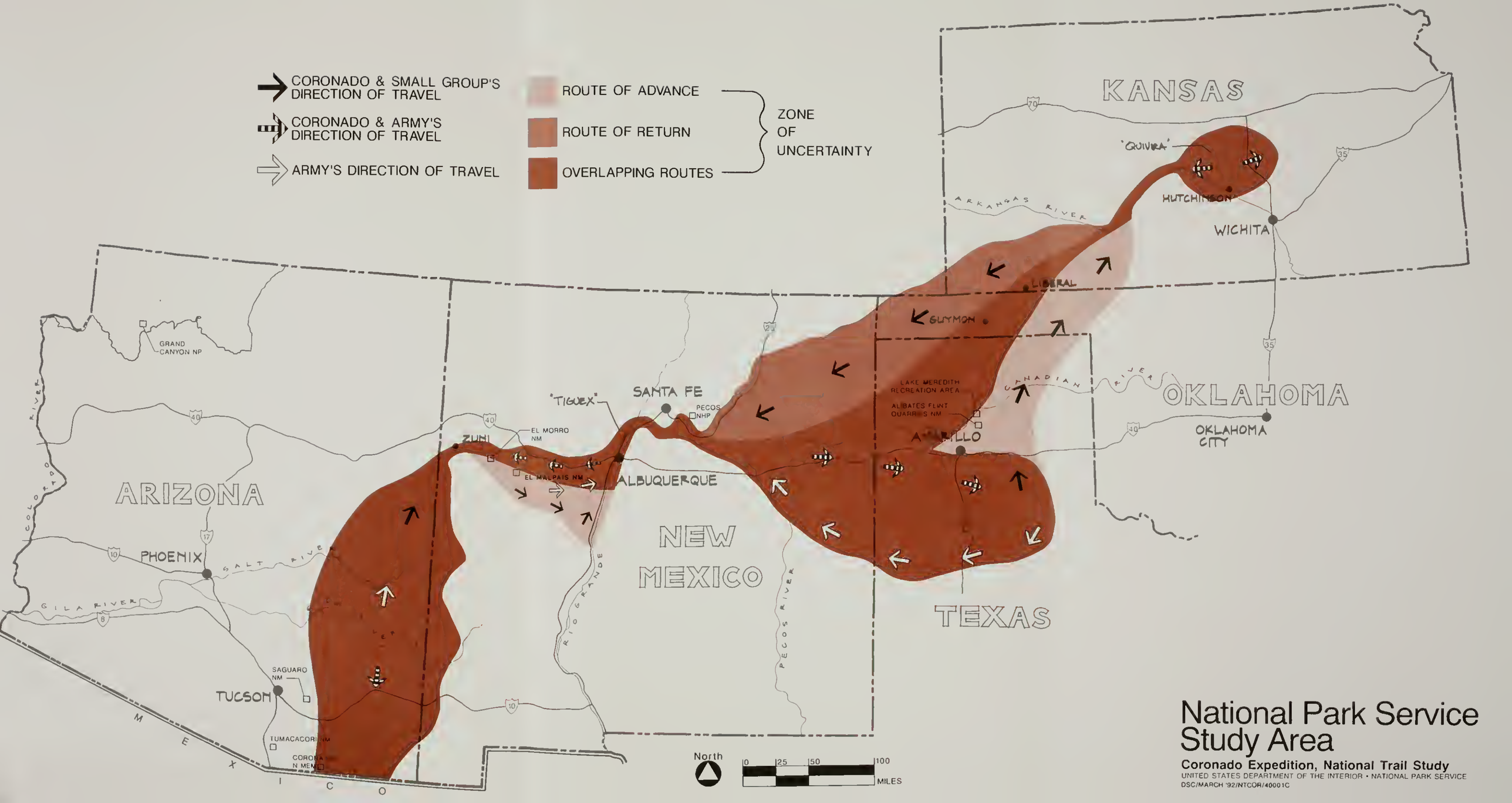

National Park Service Study Area

Coronado Expedition, National Trail Study

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vast panorama of molten black rock is punctuated by islands of green vegetation, brightly colored soils, and remnant sandstone mesas.

Beyond the malpais, the Mexican Highlands section of the Basin and Range province extends south into Mexico and east to include the Rio Grande Valley and its bordering mountain ranges. This vast area, which includes bolsons (undrained intermountain basins) among alternating arid basins and north-south oriented mountain ranges, grades into the southern end of the Southern Rocky Mountain province.

Intervening between the Mexican Highlands and the Great Plains is the Sacramento section, a narrow 300-mile-long, plateau-like area rimmed on the east by the carved divide of Glorieta Mesa. The central feature of the Sacramento section is the Estancia Valley, or Sandoval Bolson.

Southeast of Glorieta Mesa is a long trough known as the Pecos section that forms the far western portion of the Great Plains province. The topography of this section varies from flat plains to rocky canyon lands and embraces the Pecos River Valley and part of the Canadian River Basin, an area of mesas, cliffs, terraces, and canyons.

The High Plains section of the Great Plains province extends from the border of South Dakota almost to the Rio Grande. This section is the remnant of a single great alluvial slope that spreads eastward from the Rocky Mountains almost to the Central Lowlands. The surface of the High Plains is impressively flat. This is especially true of the "Llano Estacado," or Staked Plain, of New Mexico and Texas, a 20,000-square-mile area bounded on the east by the Palo Duro Canyon system and on the north by the Canadian River.

The High Plains section of Oklahoma and western Kansas consists of rolling plains, broken occasionally by steep hills, rock outcrops, canyons, and valleys. Watercourses like the Canadian, Cimarron, Arkansas, and Smoky Hill rivers follow east-southeast flowing drainages across the plains. In west-central Kansas the eastern margin of the High Plains grades into the Dissected High Plains section, an area of sharply indented east-facing escarpments and conspicuous outcrops that overlook rolling lowland plains north of the Arkansas river, covering most of north-central Kansas.

Coronado's "Quivira" is thought to lie in the Arkansas River Lowlands section of the Central Lowland province. This section is a narrow, undulating strip of land with limited relief, about 25 to 40 miles wide, that borders the Arkansas River on the south and east from about Dodge City to Wichita.

Climate

The substantial climatic variation among the physiographic provinces in the five-state region is caused by differences in latitude, elevation, landform, and the jet stream. The Sierra Nevada and Rocky Mountain ranges produce a rain-shadow effect, and storm fronts moving up from the Gulf of Mexico strongly influence weather patterns throughout the region.

Arizona's wide variations in temperature and precipitation are directly related to its topography, which ranges from low desert to high mountains. Throughout Arizona great extremes occur between day and night temperatures.

Topography and location, including ruggedness and direction of slope, also have a major effect on New Mexico's mild, semiarid to arid climate. Light precipitation totals, low relative humidities, abundant sunshine, and large extremes in temperature annually and diurnally are characteristic. Climate in higher mountainous areas is characteristic of the Rocky Mountains; the southern part of the state has a mild climate. Wide variations in annual precipitation are common. The eastern plains are open to cold continental air masses and blizzards moving out of Canada during winter months, and strong winds may accompany storms, especially in the eastern plains.

The High Plains—western Kansas, the Oklahoma and Texas panhandles, and eastern New Mexico—share a distinctly continental climate with characteristically changeable temperature and precipitation strongly influenced by the Rocky Mountains to the west and the Gulf of Mexico to the south. This dry steppe or semiarid climate changes to a moist subhumid climate in central Kansas. Plains summers are long and occasionally very hot; winters are shorter and less harsh than in northern plains states. The High Plains are subject to rapid and wide changes in temperature, especially during winter, when masses of cold air generate over the Northern Plains and Canada, moving rapidly southward across the unsheltered plains with little to impede their flow.

Flora and Fauna

Differences in biotic communities across eastern Arizona are correlated to the gradual increase in elevation and variations in climate and soils. Many of the southernmost areas of the state lie within the Lower Sonoran life zone, which includes portions of the Sonoran and Chihuahuan deserts. Vegetation typical of these deserts includes grasses, cacti, and a host of climax shrubs, trees, and desert plants. Ephemeral wildflowers are typical.

The Upper Sonoran life zone lies in slightly higher areas of this region, including the mountains and foothills bordering the San Pedro valley, where an open evergreen woodland grows in association with numerous species of grasses, dry-tropic shrubs, succulents, and some cacti. The Desert Grassland lies between the evergreen woodlands or chaparral and the desert. Chaparral occurs in central Arizona from the vicinity of the Gila River northward to the foothills of the Mogollon Rim. Rodents dominate the assortment of mammals in the southern Arizona deserts, but fauna also include reptiles and birds.

Fir forest stands of mixed species and spruce-alpine fir forests typical of the Canadian and Hudsonian life zones occupy higher elevations of southern and central Arizona. Small and medium mammals, including predators, inhabit this zone.

Parts of Arizona and New Mexico are covered by juniper-piñon woodland and associated grasses; small areas of deciduous (riparian) woodlands extend along watercourses in the lower elevations, especially near the Mogollon Rim. This biotic community includes characteristic aquatic, semiaquatic, and terrestrial animals, birds, and reptiles.

The Plains Grassland of the Upper Sonoran life zone covers much of northeastern Arizona and west-central New Mexico. In this semiarid habitat, native grasses are present in various mixtures with juniper-piñon woodland and sagebrush. Small rodents and other small and medium mammals are found in this area. Eastward across New Mexico, the open juniper-piñon woodland gradually gives way to the Transition life zone, where ponderosa pine and Douglas-fir forests are interspersed with small grassy meadows. Along the borders of lava flows, small bands of deciduous trees provide a rich and diverse habitat for wildlife.

The Lower and Upper Sonoran life zones are found along the southern and central portions of the Rio Grande valley, respectively. The riparian habitat along the river supports a variety of native and migratory species and is on a major migratory bird route.

Plains cottonwoods and scrub trees and shrubs grow along watercourses in the shortgrass prairies of eastern New Mexico, Texas, Oklahoma, and Kansas. Many species of birds, reptiles, and large and small mammals are found here. The wolves and herds of bison reported by Coronado no longer can be found in the central Great Plains, and the territories of other animals, such as bighorn sheep, have been greatly diminished.

CULTURAL RESOURCES

Thousands of prehistoric and historic sites are within or close to the study route. Hundreds of these sites are listed on the National Register of Historic Places, and some have national historic landmark (NHL) status. Only a few sites can be related directly to Coronado's expedition or to the native peoples he encountered.

Archeological Sites

Southeastern Arizona has a number of important archeological sites that date to the 16th century, but none of them presents unequivocal evidence of the expedition's presence. Most scholars agree that the 16th century province of Cibola visited by Coronado was made up of the villages of Hawikku, Kechiba:wa Kwa:kin:a, Halona:wa, Mats'a:kya, and Kyaki:ma.[1] These Zuni villages were concentrated along a 25-mile stretch of the Zuni River near New Mexico's western border. Clearly, Coronado and his expedition visited Pecos Pueblo, and it is likely that the group wintered at the Rio Grande pueblos in the vicinity of present-day Bernalillo. There are many other large pueblos in the Rio Grande and Galisteo River basins that probably were visited by the Spaniards (see appendix C), but precise documentation is lacking.

There are no archeological sites in Texas or Oklahoma that can be definitively linked to the Coronado expedition. A number of 16th century sites, including Apache campsites, are found throughout the panhandle area, but because the route is not sufficiently known, none of these has been specifically identified as a Coronado contact site.

Great Bend Aspect sites in Kansas, with remains of grass lodges, extensive trash mounds or middens (often buried in bell-shaped subsurface excavations), and large "council circles,"

1. The seventh of the legendary cities of Cibola has not been positively identified.

closely resemble the Quiviran villages described in Coronado's narratives.[2] Inhabitants of this area were related to or part of the historic Wichita tribal group. Artifacts from these sites include 16th and 17th century potsherds (probably trade vessels) from the Rio Grande, Pecos, and Galisteo valleys and various objects of European manufacture like glass beads, iron pieces, rolled copper strips, and chain mail.

The major sites thought to have been associated with Coronado's Quivira are along Cow Creek, west of Lyons, Kansas (Malone site, 14RC5; Saxman site, 14RC301); the Little Arkansas River, northeast of Lyons (Majors site, 14RC2; Kermit Hayes no. 1, 14RC3; Tobias site, 14RC8; C. F. Thompson, 14RC9; Paul Thompson, 14RC12; Kermit Hayes no. 2, 14RC13; and Taylor, 14RC14); and tributaries along the southern valley of Smoky Hill River, west of Lindsborg (Paint Creek Site, 14MP1; Sharps Creek or Swensen site, 14MP301). These sites are listed on the National Register individually (Sharp's Creek, Paint Creek, Malone, and Saxman sites) or as part of the Little River Archeological District, also known as the Tobias-Thompson complex (Kermit Hayes sites nos. 1 and 2, the Taylor site, the Majors site, the C. F. and Paul Thompson sites, and the Tobias site). The Tobias-Thompson complex is an NHL. See appendix C for more information on these sites.

National Historic Landmarks

National historic landmarks in Arizona that lie within the study area but are not pertinent to Coronado's expedition are as follows: the important territorial outpost of Fort Huachuca, which was central to the campaign to capture Geronimo (near Sierra Vista); the outstanding 11,000-year-old Lehner Mammoth-Kill site (Hereford vicinity); the large Anasazi ruin of Casa Malpais, built in a defensive position on fallen lava (near Springerville); Kinishiba Ruin, a former pueblo capable of housing about 1,000 whose culture represented a blend of Mogollon and Anasazi ancestry (Whiteriver vicinity); Point of Pines sites, with a considerable number of ruins representing a long period of occupation (Morenci vicinity); and the Sierra Bonita Ranch, the first cattle ranch in Arizona to survive Apache attacks (southwest of Bonita).

The Zuni-Cibola complex in New Mexico is an NHL. It is composed of ancestral Zuni pueblos known as the Village of the Great Kivas, Yellow House, Kechiba:wa, and Hawikku (Zuni vicinity). The Pueblo of Acoma and San Estevan del Rey Mission Church at Acoma are also NHLs. NHLs in central New Mexico include the Early Man site of Sandia Cave (Bernalillo vicinity); Kuaua (Bernalillo); San Lazaro Pueblo Ruin (Galisteo Basin); Rabbit Ears (Clayton vicinity); Wagon Mound (Wagon Mound); and Watrous (Watrous). Rabbit Ears and Wagon Mound were major landmarks on the Cimarron route of the Santa Fe Trail, and Watrous or La Junta was the point at which the Mountain and Cimarron routes divided. See discussion of national park system units in the "Socioeconomic Environment" section for the Glorieta Pass Battlefield (Santa Fe vicinity) and Pecos Pueblo (Pecos).

The J. A. Ranch (Palo Duro Canyon) in Texas recognizes accomplishments of pioneer cattleman Charles Goodnight; the Landergin Mesa sites comprise a large, well-stratified Panhandle culture ruin (Vega vicinity).

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2. There appears to have been an astronomical relationship among the council circles involving observation of the winter and summer solstices.

The Stamper site in Oklahoma (Optima vicinity) is an NHL. It is one of the few excavated sites of the North Canadian River branch of the Panhandle culture. Camp Nichols (Wheeless vicinity) was established by Kit Carson to protect wagon trains on the Santa Fe Trail.

NHL sites in Kansas along the Coronado study route include the well-preserved Santa Fe Trail ruts (west of Dodge City on US 50) and Wagon Bed Springs, an oasis on the dry 60-mile stretch of the Cimarron route (Ulysses vicinity). Fort Larned National Historic Site (Larned) is an NHL (see description under national park system units in the "Socioeconomic Environment" section). Individual sites in the Tobias-Thompson complex (an NHL) were discussed previously.

SOCIOECONOMIC ENVIRONMENT

Scenic Highways and Auto Tour Routes

The Coronado Trail Scenic Byway covers 123 miles of U.S. Highway 666. Beginning in semi-desert terrain, the byway winds up the Mogollon Rim from huge open mines near Clifton and Morenci to Springerville through spruce, fir, and pine of the Apache-Sitgreaves National Forest. This commemorative highway, completed in 1926, has been thought to parallel segments of Coronado's route.

The "Old Spanish Trail" highway once linked Florida, California, and Mexico. Through southeastern Arizona this highway ran along the corridor now occupied by Interstate 10.

The Cibola National Forest has established a 60-mile auto tour route through the Zuni Mountains of western New Mexico. The historical tour includes locations related to activities associated with railroad logging in the Zunis from 1892 through 1942. Visitors using the route also see a sample of the area's colorful scenery.

The congressionally established Masau Trail is an auto tour route administered by the National Park Service that will link a number of New Mexico (and some northeastern Arizona) Indian pueblos, archeological sites, and state and national parks.

Congress recently authorized a study of U.S. Route 66, "America's Main Street" and possibly its most famous highway. In central New Mexico and the Texas panhandle, old Route 66 may have followed the same general corridor as did Coronado's expedition.

The Panhandle Plains Highway in Texas is a state-designated auto tour route that roughly parallels the Coronado route from the Palo Duro Canyon area north to Oklahoma.

Kansas scenic route 16 begins in the town of Cimarron in Gray County and follows US 50 and US 154 through Dodge City, terminating in Ford, Kansas. Historical points of interest along the route are related to the Santa Fe Trail, as well as to the cattle drive trails and military forts and supply depots that typify the Western frontier in western Kansas.

Another Kansas scenic route (no. 18) begins in Meade, running through agricultural and ranching land before entering the Crooked Creek Valley and Lake Meade State Park, an area known for its many artesian wells, towering cottonwoods, and spring-fed lake.

National Park System Units

Coronado National Memorial (vicinity of Hereford, Cochise County), Arizona. Coronado National Memorial commemorates the first major exploration of the American Southwest by Europeans, which is the subject of this report, and it promotes further understanding of the cultural ties that link our country with Mexico and Spain. Situated in open oak forests on the Mexican border on the southeastern slope of the Huachuca Mountains, this National Register property overlooks the San Pedro River valley and a rural area of Mexico. It offers interpretive programs, a picnic area, scenic overlooks, and hiking trails. Coronado National Memorial was originally planned as a counterpart to a sister park in Mexico, but no action was taken by the Mexican government to implement an adjoining park.

El Morro National Monument (vicinity of Ramah, McKinley County), New Mexico. Fifteen years before pilgrims landed at Plymouth Rock, Don Juan de Oñate left the first Spanish inscription on the soft sandstone cliffs of El Morro (Inscription Rock). Hundreds of inscriptions and petroglyphs line the walls of this striking headland landmark, recording visits of prehistoric Indians and later travelers who camped among El Morro's sheltered coves or sought out its large natural basin of rain and melted snow. It is likely that Coronado's party passed by "El Estanque del Penol," the pool by the great rock, on their way to Acoma.

El Malpais National Monument (South of Grants, Valencia County), New Mexico. Much of the great lava flow south of Grants, New Mexico, was set aside as El Malpais National Monument in 1987, along with an adjacent national conservation area managed by the Bureau of Land Management. El Malpais—"the badlands" in Spanish—is a spectacular volcanic area, partially formed as recently as 1,000 years ago, featuring spatter cones, a 17-mile-long lava tube system, natural arches, and ice caves. It probably posed a natural barrier to the Coronado entrada. The area, rich in Indian history, features diverse ecosystems. The lava flows contain kipukas, outcrops of older rock surrounded by later lava flows. The Zuni-Acoma Trail and the Dominguez-Escalante Trail crossed the malpais; the 35th parallel route cut across its northern edge, as did the old Fort Twingate military road.

Petroglyph National Monument (Albuquerque, Bernalillo County), New Mexico. The National Park Service, the city of Albuquerque, and the state of New Mexico work cooperatively to manage Petroglyph National Monument, a new area established in 1990 just west of Albuquerque. Here, petroglyphs have been incised through the dark patina of boulders fallen from a 15-mile-long stretch of basalt cliffs of West Mesa. Most of the 15,000 petroglyphs, which represent Rio Grande style rock art, chronicle the advent of Kachinaism in the Southwest. Some petroglyphs may date as early as the Archaic period, while others reflect post-contact Hispanic culture.

Fort Union National Monument (between Wagon Mound and Watrous, Mora County), New Mexico. Three U.S. Army forts were built on this site, a key defensive point on the Santa Fe Trail, and were occupied from 1851 to 1891. Ruins of the last fort, which was the largest military post in the Southwest, have been stabilized. Army troops stationed at the adobe outpost of Fort Union once protected the wagon caravans traveling between Missouri and Santa Fe along the Santa Fe Trail.

Pecos National Historical Park (vicinity of Pecos, San Miguel County), New Mexico. Pecos Pueblo reached its zenith in the 15th century as a major trading center strategically located between the nomadic buffalo hunters of the plains and the Rio Grande. In 1540 the Coronado expedition visited the pueblo, followed by other Spanish explorers and settlers, including Juan de Oñate. A church and convento established at the pueblo by the Franciscans early in the 17th century were destroyed during the Pueblo Revolt of 1680. The mission was reestablished in 1693, and a church and convento were rebuilt by 1707. Comanche raids in the mid-1700s, along with a dwindling population and disrupted economy, caused the eventual abandonment of the pueblo by 1838.

The secretary of the interior designated the site an NHL in 1960, and Congress established Pecos National Monument in 1965. The monument was enlarged and designated a national historical park in 1990. Resources include ruins of native American sites from A.D. 800 to 1800, 17th and 18th century Spanish colonial missions, ruts of the Santa Fe Trail, a Santa Fe Trail stage stop, several miles of the Pecos River, and structures and landmarks associated with the Civil War Battle of Glorieta.

Lake Meredith Recreation Area and Alibates Flint Quarries National Monument (Vicinity of Fritch, Hutchinson, Moore, Potter, and Carson Counties), Texas. Lake Meredith National Recreation area (originally Sanford National Recreation Area) lies on the dry, windswept plains of the Texas panhandle. Sanford Dam, built in the 1960s, impounded the waters of the Canadian River in its 200-foot-deep canyons to create this 20-mile strip of water. The National Park Service administers this nearly 46,000-acre area under a cooperative agreement with the Bureau of Reclamation. A 93-acre portion of the recreation area is set aside as the Alibates Flint Quarries National Monument. For more than 10,000 years, the bluffs and ridges of the Canadian River breaks were quarried for raw materials to make stone tools and weapons. The distinctive agatized dolomite was widely traded and used across the West, and prehistoric trails linked the quarries with distant areas.

Fort Larned National Historic Site (Larned, Pawnee County), Kansas. A military outpost was established midway along the Santa Fe Trail in 1859 to protect the mail and travelers. Fort Larned served as a bureau for the Indian Agency during much of the 1860s and was a key military base of operations during the Indian War of 1868-69. The fort was deactivated in 1878 and sold at public auction in 1884. The stone buildings are among the best preserved vestiges of the Indian War era.

National Forests and National Grasslands

In Arizona the study route crosses the Coronado and Apache-Sitgreaves National Forest. Parts of the Zuni, Datil, and Gallinas mountains of western New Mexico lie in the Cibola National Forest, as do the Sandia Mountains east of Albuquerque. Glorieta Mesa and the high country northeast of Villaneueva State Park are part of the Santa Fe National Forest.

Near the Oklahoma panhandle, the study route passes near Kiowa National Grassland in New Mexico and Cimarron National Grassland in Kansas. Around 143,000 acres of rangelands in northeastern New Mexico, badly damaged by wind erosion during the 1930s Dust Bowl, have been reclaimed as Kiowa National Grassland. The grassland is used for grazing and offers opportunities for recreation such as hunting, fishing, hiking, and camping.

Cimarron National Grassland in Kansas is an uninterrupted strip of land about 25 miles long by 4 miles wide, with the Cimarron River winding through the middle. This land, reclaimed and reseeded after the Dust Bowl, now supports cattle grazing and oil and natural gas production. A segment of the Santa Fe National Historic Trail crosses this grassland.

Indian Lands

The coterminous Fort Apache and San Carlos Indian reservations, which contain a number of important prehistoric and historic cultural sites, stretch across the Mogollon Rim southward into the Gila River drainage in Arizona. Coronado probably traveled through this area. His route through western New Mexico certainly would have gone through what is today the Zuni Indian Reservation and probably went through lands now occupied by the Ramah Navajo. Small groups of Navajo were living in the immediate vicinity of Ramah during the mid-1800s before their captivity at Fort Sumner. After their release in 1868, seven of the original families returned to the Ramah area, and in the 1930s the Ramah Chapter of the Navajo Nation was formally recognized.

In New Mexico, springs at San Rafael and Ojo Caliente are important to a number of American Indian groups, especially the Zuni, Acoma, and Navajo. The entire area has religious importance to several contemporary American Indian groups, including the Acoma, Zuni, Laguna, and Ramah Navajo. The Acoma and Laguna reservations today cover the central part of the Zuni-to-Albuquerque corridor, along which Coronado's expedition probably traveled. Several different Pueblo Indian groups live along the Rio Grande drainage, including Isleta, Sandia, San Felipe, Santo Domingo, and Cochiti. Santa Ana, Zia, and Jemez pueblos, on drainages west of the Rio Grande, probably were visited by Coronado's expedition.

Wilderness Areas

Three wilderness areas in Arizona's Coronado National Forest are along the study route. Miller Peak Wilderness Area takes in the upper elevations of the Huachuca Mountains adjacent to Coronado National Memorial. The Galiuro Wilderness Area encompasses the central portion of the Galiuro Mountains. Higher elevations of the Santa Teresa Mountains have a wilderness area of the same name.

The 165,000-acre Blue Range primitive area in the Apache-Sitgreaves National Forest, Arizona, is the last primitive area in the national forest system. The Bear Wallow Wilderness Area includes a portion of the Mogollon Rim; the Mount Baldy Wilderness Area includes part of Mount Baldy.

The Cibola Wilderness Area encompasses 62,000 acres of forested rimrock country east of New Mexico Highway 117. North of county road 42 is the West Malpais Wilderness Area, which includes the "Hole in the Wall," a large ponderosa pine parkland surrounded by lava. The Chain of Craters, a line of 30 cinder cones lying along the western edge of El Malpais, is under study as a wilderness area.

Also along the study route are several wilderness areas managed by the Bureau of Land Management. Adjacent to the Galiuro Wilderness Area on the south is Redfield Canyon

Wilderness, 6,600 acres encompassing the canyon and the Galiuro escarpment, as well as a variety of small canyons containing perennial streams. Fishhooks Wilderness occupies 10,500 acres in an isolated section of the Gila Mountains north of the Gila River. It contains several canyons and Gila Peak, which supports a forest of border piñon pine, found only in southeastern Arizona. Black Rock and Jackson Mountain are in the North Santa Teresa Wilderness, 5,800 acres adjoining the Forest Service's Santa Teresa Wilderness Area on the northeast. Aravaipa Canyon Wilderness encompasses 19,410 acres, including the 11-mile Aravaipa Canyon and surrounding tablelands, as well as nine side canyons of Aravaipa Creek above the San Pedro River. Needle's Eye Wilderness, 8,760 acres on the Gila River below Coolidge Dam, contains three canyon segments with 1,000-foot walls.

Trails

The General George Crook Trail in Arizona was part of a long-distance military supply route linking Prescott to New Mexico forts in the 1870s. This trail crosses the Prescott, Coconino, and Apache-Sitgreaves national forests en route from Fort Whipple to Fort Apache. The General Crook Trail is being studied by the Forest Service, U.S. Department of Agriculture, for possible designation as a national historic trail. The route provides breathtaking long-distance views of south-central Arizona from the Mogollon Rim, a viewshed that may include the route chosen by Coronado.

Several American explorers and surveyors crossed Arizona in the 1850s. The east-west routes include those of Whipple's survey for a transcontinental railroad along the 35th parallel, Sitgreaves' search for a wagon road west from Zuni to California, and others like Emory, Park, Gray, and Bartlett, who explored southern Arizona. These routes crossed, or in some cases paralleled, the Coronado route.

The state-sponsored Arizona Trail begins at Montezuma Pass in the Coronado National Memorial and follows the crest of the Huachuca Mountains northward. Swinging through the Santa Rita, Rincon, and Santa Catalina mountains, it crosses the Gila River between Winkelman and Florence before curving northeast to Superior and the Superstition Mountains. From the Roosevelt Dam this hiking and horseback riding corridor winds north and east across Arizona, traversing the Grand Canyon before it ends at Wire Pass near Fredonia.

The Zuni-Acoma Trail was a major Pueblo Indian trade and pilgrimage route that linked those pueblos in New Mexico. It crosses El Malpais National Monument and Conservation Area about 18 miles south of Grants. The trail has no formal state or national designation.

El Camino Real followed the Rio Grande valley corridor from El Paso to Santa Fe. The Goodnight-Loving Trail may have paralleled Coronado's route along the Pecos River for a short distance.

None of Oklahoma's hiking, motorcycle, and nature trails cross the study area. The Santa Fe National Historic Trail bisects the far northwestern corner of the Oklahoma panhandle.

Major historic trails in Kansas that approximate or parallel the Coronado study route include the Santa Fe National Historic Trail, Captain Zebulon Pike's 1806 route, and the cattle trail to Dodge City, 1875-1885. The Coronado route may have been crossed by Nathaniel

Boone's 1843 route, which ran north-south into the Great Bend-Lyons area, and the short-lived Ellsworth Cattle Trail, 1872-1874, also a north-south trail extending to Ellsworth from the Texas cattle country.

Monuments, Memorials, and Local Museums Not Managed By the National Park Service

A number of monuments and historical markers have been erected by private organizations and state and local historic groups to commemorate the Coronado expedition and related people and events. Several museums also dedicate a portion of their programs to Coronado.

In 1928 a Madonna of the Trail monument was erected in Springerville, Arizona, to help commemorate the National Old Trails Road. Recognition of the Coronado expedition was engraved on the base of the monument. The placing of this monument was part of a nation-wide effort by the National Old Trails Association, the Daughters of the American Revolution, and businesses along "the old route over which our mothers came" in crossing 12 states from Pennsylvania and Maryland westward to California. The monument was placed at the approximate intersection of the National Old Trails Highway (U.S. Route 70) and the Coronado Trail (U.S. Highway 666).

Built on a hill 1½ miles east of Fort Dodge, Kansas, the Coronado cross and park commemorate Father Juan Padilla's mass of thanksgiving, which was celebrated after Coronado's expedition reached the river of St. Peter and St. Paul (the Arkansas River). There is also a cross commemorating Father Padilla near Lyons; another cross at coronado Heights near Lindsborg commemorates the expedition. There are monuments to the Coronado entrada outside the study area as well; one is in Junction City, Kansas, A marker to honor Father Padilla is near Council Grove.

Several museums in Kansas present the Coronado expedition in their programs, including the Seward County Museum in Liberal and the Rice County Historical Museum in Lyons.

Other Resource Areas

Ramsay Canyon, 7 miles south of Sierra Vista, Arizona, is a vertical-sided gorge whose well-defined microclimatic habitat consists of an extension of Mexican flora and fauna into the United States. Many of these species normally are found only at higher elevations. This privately owned canyon, which is listed on the National Registry of Natural Landmarks, is a significant example of the nation's natural heritage.

The San Pedro Riparian National Conservation Area, containing about 40 miles of the upper San Pedro River, was designated by Congress in 1988 to protect and enhance the desert riparian (streamside) ecosystem, a rare remnant of what was once an extensive network of riparian systems throughout the Southwest. Managed by the Bureau of Land Management (BLM), this 50,000-acre conservation area stretches between the international border with Mexico and St. David, Arizona.

The BLM also administers the Empire/Cienega Resource Conservation Area, a working ranch of 45,000 acres in southeastern Pima and northeastern Santa Cruz counties, Arizona.

Cattle have grazed on this ranch for nearly 300 years, since Father Eusebio Francisco Kino, a Jesuit missionary, explorer, and founder of the livestock industry in the territory that became Arizona, delivered 150 head of cattle to the Rancheria Sonoita, near the headwaters of Cienega Creek. In 1876, entrepreneur Walter L. Vail acquired a 160-acre ranch, including 612 head of cattle. By 1905, the Empire Ranch, as it had come to be known, covered more than 1,000 square miles. A series of private landowners bought and sold surrounding properties for grazing, water, and mineral rights over about 80 years, but little development occurred. In the 1980s a groundswell of public support developed for preserving ranches and their natural resources in nearly pristine condition. A series of land exchanges in 1988 brought the property into public ownership. Under BLM administration, grazing continues on the ranch under a lease agreement.

Eight miles southwest of Willcox, Arizona, is Willcox Playa, a dry remnant of Pluvial Lake Cochise. The natural deposits of the playa contain a rich record of climatic effects and fossil pollen. The largest dry lake in Arizona, Willcox Playa is listed on the National Registry of Natural Landmarks.

As part of the Arizona Natural Heritage Program, parts of Aravaipa Canyon are set aside as a wildlife management area co-sponsored by the BLM, the Nature Conservancy, the state of Arizona, Defenders of Wildlife, and the George Whittell Wildlife Trust. This canyon, at the intersection of the Sonoran Desert and wetter vegetation communities to the north and east, contains a diverse collection of animals with representative species from Mexico, the desert, and the northern mountains.

Gila Box Canyon, between Safford and Clifton, Arizona, has been designated a riparian national conservation area. The canyon, an outstanding example of a cottonwood-willow plant community, contains one of the most diverse assemblies of bird species in the country. The canyon wends through colorful hard rock formations of volcanic tuff, andesite flows, conglomerates, and breccias, providing many hiking and canoeing opportunities.

Muleshoe Ranch is held jointly by the BLM, the Forest Service, and the Nature Conservancy. The ranch, at the south end of the Galiuro Mountains in Arizona, is an example of diverse low-elevation habitat and contains natural and cultural resources of interest to visitors.

El Malpais National Conservation Area (NCA) south of Grants, New Mexico, was set aside along with El Malpais National Monument (NM) in 1987. The 26-mile-long lava flow is a classic example of recent extensive volcanism; it contains lava flows that appear fresh and unweathered. Its gigantic pressure ridges, collapse depressions, and lava tubes are outstanding; they form the basis for its inclusion on the National Registry of Natural Landmarks. The BLM cooperates with the National Park Service in the administration of El Malpais NCA and NM.

The Barker State Wildlife Area, 15 miles northwest of Cimarron, New Mexico, provides seasonal hunting and wildlife viewing on 5,400 acres of wildlife habitat. Bueyeros Shortgrass Plains, 17 miles east of Bueyeros, are a prime example of the blue grama-buffalograss prairie of the Great Plains considered to be typical of the pre-cattle grazing era. Two of the three dominant natural grazing animals (antelope and prairie dogs) are still in the area. This privately owned area is listed on the National Registry of Natural Landmarks.

Palo Duro Canyon State Park, in the vicinity of Canyon, Texas, is listed on the National Registry of Natural Landmarks. The rugged scenic canyon, carved almost 800 feet deep by waters of the Prairie Dog Town Fork of the Red River, contains cross-sectional views of sedimentary rocks representing four geological periods, as well as Triassic and Pliocene vertebrate fossils. The larger canyon complex of which Palo Duro is a part forms a distinctive and spectacular separation between the high caprock escarpment of the western panhandle and the lower rolling plains of north-central Texas.

The High Plains Natural Area is near Amarillo, Texas. This federally owned natural landmark contains a grama-buffalo shortgrass association representative of the High Plains region.

Kansas State fishing lakes along the study route are Clark (Clark County); Hain (Ford County); Hodgeman (Hodgeman County); McPherson (McPherson County); and Saline (Saline County). All these state fishing lake areas except Saline are also wildlife areas or game refuges. Other state and federal wildlife areas in Kansas are the Morton wildlife area near Elkhart; Stevens County near Hugoton; Meade fish rearing station (Meade); Edwards County near Kinsley; and Cheyenne Bottoms near Great Bend. Kansas state parks along the study route are Kanopolis and Mushroom Rock state parks, both near Carneiro, and Meade State Park near Meade.

Quivira National Wildlife Refuge is located on Rattlesnake Creek near Stafford, Kansas, in Stafford, Rice, and Reno counties. This 21,000-acre area is a migration and resting stop for birds on the Central Flyway, and it provides critical habitat for the interior least tern and the whooping crane.

Fifteen miles west-northwest of Ashland, Kansas, in Clark County is the Big Basin Preserve and St. Jacob's Well. This state property is listed on the National Registry of Natural Landmarks as an excellent example of a collapse feature formed by groundwater geological processes and of bluestem-grama prairie, which is intensively grazed elsewhere in the central Great Plains.

Near Lindsborg, Kansas, an isolated butte known as Coronado Heights rises above the surrounding countryside. Dedicated in 1924 to commemorate Coronado, this local landmark is topped by a limestone fortress built in 1936 by the Works Progress Administration.

Landownership and Land Use

The ownership and use of land vary substantially in the five states traversed by the Coronado route. In Arizona and New Mexico, land in the study area is held primarily by the federal government and state governments. However, 30%–40% of the route in Arizona and New Mexico passes through Indian reservations and private lands. Management is divided fairly evenly among agencies; no one agency manages a large share of the public lands.

In Texas, Oklahoma, and Kansas, land in the study area is almost entirely owned by private individuals. Small pockets of public lands and highway corridors are in public ownership.

Land use also varies considerably over the length of the route. While much of the land in Arizona and New Mexico is undeveloped and portions show minimal human influence, the route passes through extensive areas used for grazing lands and cultivated farmlands, as well as industrial areas such as the Coronado generating station in northeast Arizona. Land use in the Texas and Oklahoma panhandles and in southwestern Kansas is predominantly farming; mostly cultivated fields containing primarily milo and winter wheat. Other than Albuquerque and Amarillo, the route does not pass through large urban areas. There are numerous small- to medium-sized towns along the corridor, especially in Kansas and the panhandle area.

NATIONAL TRAIL ELIGIBILITY

Under the National Trails System Act (16 U.S.C. 1241 et seq.), national historic and scenic trails are "extended trails," which means they should be at least 100 miles long. The route taken by the Vázquez de Coronado expedition covers approximately 1,400 miles. Following is an analysis of the eligibility of the route of that expedition for designation as a national historic or national scenic trail.[3]

NATIONAL HISTORIC TRAIL CRITERIA

Determination of the eligibility of a route as a national historic trail is based on the criteria set forth in the National Trails System Act (16 U.S.C. 1241 et. seq.). Section 5(b)(11) of the act provides three broad criteria. All three criteria must be met for a trail to qualify for designation. These criteria are stated below, followed by an analysis of the Coronado route for each criterion.

> (A) It must be a trail or route established by historic use and must be historically significant as a result of that use. The route need not currently exist as a discernible trail to qualify, but its location must be sufficiently known to permit evaluation of public recreation and historical interest potential. A designated trail should generally accurately follow the historic route, but may deviate somewhat on occasion of necessity to avoid difficult routing through subsequent development, or to provide some route variations offering a more pleasurable recreational experience. Such deviations shall be so noted on site. Trail segments no longer possible to travel by trail due to subsequent development as motorized transportation routes may be designated and marked on-site as segments which link to the historic trail.

The Coronado expedition route does not meet this criterion. The route was indeed the result of historic use, but as discussed in the "Summary of History Research" section, the overall location of the route is not sufficiently known at this time. While some segments of the trail can be defined with a reasonable degree of confidence, these are relatively short, constituting only about 10% of the total length. The Study Area map displays this difficulty as shown by the broad zone of uncertainty surrounding them.

The location of some specific sites visited by Coronado or his entrada, such as Pecos Pueblo, can be identified. There are only a few sites along the main expedition route that can be specifically tied to visits by Coronado. These include Cibola (Zuni pueblos), Tiguex (near present Bernalillo, New Mexico), Pecos Pueblo, and Quivira (prehistoric sites in central Kansas). Even at these sites (except Pecos), the study team could only put Coronado in the general vicinity, not at a specific site. For example, there is still debate as to whether Coronado was at Hawikku or another Zuni pueblo.

Members of the expedition did not always travel together and by the same route. For example, from Cibola (the Zuni pueblos) to Tiguex on the Rio Grande River, Coronado and a

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3. National recreation trails are designated by the secretary of the interior upon application by managing entities. They do not involve an ongoing federal administrative responsibility, nor do they require study under the National Trails System Act; therefore, the route is not evaluated for recreation trail eligibility.

small party took a southerly route while the main body of the expedition took a more direct route. There is little evidence to accurately locate the southern route followed by Coronado, and although there is more evidence on which to base a determination of the more direct route, there are still several areas of contention with wide spatial variation in the different possible routes. The travels of Coronado's lieutenants to the Grand Canyon and elsewhere are even less well known than the main expedition route because there was less documentation by these secondary expedition members.[4]

(B) It must be of national significance with respect to any of several broad facets of American history, such as trade and commerce, exploration, migration and settlement, or military campaigns. To qualify as nationally significant, historic use of the trail must have had a far-reaching effect on broad patterns of American culture. Trails significant in the history of native Americans may be included.

The Coronado expedition route meets this criterion. It was not only of national significance, but of international significance. The expedition brought together European and American Indian cultures and began the series of events that shaped the development of much of the western North American continent. The "Significance of the Expedition" section presented earlier contains more information on the importance of this early exploration by Coronado.

(C) It must have significant potential for public recreational use or historical interest based on historic interpretation and appreciation. The potential for such use is generally greater along roadless segments developed as historic trails and at historic sites associated with the trail. The presence of recreation potential not related to historic appreciation is not sufficient justification for designation under this category.

This criterion requires evaluation of the potential for use of and interest in the actual resources of a proposed trail route, not the degree of public interest in general history and the importance of the "trail." Because the Coronado route cannot be accurately determined, there is no physical trail resource base that can be evaluated. Therefore, this criterion is not met.

As has been mentioned, only a few specific sites can be directly associated with the expedition. Some of them already offer significant public education, recreation, and interpretation of the Coronado expedition. The Coronado National Memorial in Arizona offers excellent interpretation of the expedition, but the interpretation is not tied to resources at the memorial that are directly linked to the expedition. Lack of an accurate route definition allows general interpretation and education on the Coronado expedition story that is only indirectly related to a resource base with historical integrity.

NATIONAL SCENIC TRAIL CRITERIA

While the Coronado expedition is of great historical significance and the primary interest has been in its eligibility as a historic trail, the bill passed by Congress requested an analysis of the feasibility of authorizing a trail under the National Trails System Act; it did not limit consideration only to a historic trail. Therefore, the study team evaluated the route for national scenic trail designation. Because the act contains only minimal criteria to evaluate

4. Because of time and funding restrictions and an interpretation of the legislative intent, the research carried out by the study team concentrated on the route followed by Coronado himself.

eligibility for a national scenic trail, the team used a set of criteria for scenic trails based on the act. These criteria, which were approved by the secretaries of the interior and agriculture in 1969, are stated below, followed by an analysis of the Coronado route for each criterion.

> *A: National Significance.* National scenic trails, for their length or the greater portion thereof, should incorporate a maximum of significant characteristics, tangible and intangible, so that these, when viewed collectively, will make the trail worthy of national scenic designation. National significance implies that these characteristics; that is, the scenic, historical, natural, or cultural qualities of the areas through which the trail passes, are superior when compared to those of other trails—not including national scenic trails—situated throughout the country. National scenic trails should, with optimum development, be capable of promoting interest and drawing power that could extend to any section of the conterminous United States.

The Coronado expedition route passes through five states, and there are many fine resources along the corridor, including some of national significance. A few areas possess exceptional qualities; however, these tend to be either specific sites or short segments of the route. Because of subsequent development and land use intrusions, the original natural and scenic character along the corridor has been altered significantly. In many areas it is impossible to find a view that does not include power lines or roads. In some areas, although there are fewer intrusions, the resources are not of superior quality and would result in routing through long sections of uniform and undistinguished terrain. Although these have some value in re-creation of the experience of the Coronado expedition through similar terrain, it is not felt that this would draw or promote interest from around the country. When compared to other long-distance trails in the region, such as the Arizona Trail and the Colorado Trail, the overall significance of the scenic resources of the trail are not superior. While some trail segments are definitely superior and meet this criterion, it would not be possible to complete a continuous trail (see F, below) that meets this criterion as a whole. Therefore, this criterion is not met.

> *B: Route Selection.* The routes of national scenic trails should be so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass. They should avoid, insofar as practicable, established highways, motor roads, mining areas, power transmission lines, existing commercial and industrial developments, range fences and improvements, private operations, and any other activities that would be incompatible with the protection of the trail in its natural condition and its use for outdoor recreation.
>
> National scenic trails of major historic significance should adhere as accurately as possible to their main historic route or routes.

This criterion is not met because much of the area through which the Coronado expedition passed has been altered by subsequent developments. These include major areas of cultivated lands, mining sites, power plants, transmission lines, roads, and housing. Such intrusions are more visible along the eastern half of the trail, but they are not limited to that area. Most of the lands crossed by any potential route are in private ownership and being used for farming, grazing, and other modern purposes.

A secondary criterion requires scenic trails of historical significance to "adhere as accurately as possible to their main historic route . . ." This criterion was established before the amendments to the National Trails System Act that created the national historic trail category in 1978. Before that date, there was no way to commemorate a historic trail unless it could

qualify as a national scenic trail. However, this criterion is still valid if a commemorative trail for the Coronado expedition is to have reasonable historical integrity for public appreciation and interpretation of the historical significance of the expedition. As discussed earlier, over much of its length the Coronado route cannot be identified closely enough to meet this criterion. A route designated at this time would be seriously compromised as a vehicle for public education and interpretation of the Coronado expedition story if later research identified a more accurate historic route in a different location.

In addition, the closer any scenic trail routing would be to the preliminary study route identified by the National Park Service, the more modern intrusions would be experienced. Some sections might also result in conflicts with American Indian sites and trails of religious significance.

> *C: Accessibility.* National scenic trails should be provided with adequate public access through establishment of connecting trails or by use of trail systems other than the National Trails System. Access should be provided at reasonable intervals and should take into consideration the allowance for trips of shorter duration.

Road access to most locations along the entire route is quite good. The expedition route potentially connects to or crosses other major trails such as the Arizona Trail (state) and Continental Divide National Scenic Trail. Other trail access is possible where the potential route passes through federal and state forest and park lands. There would be numerous potential access points at public road crossings on the eastern half of the route, where the trail route is predominantly on privately owned land.

> *D: Placement.* National scenic trails shall be primarily land based.

The potential route would be entirely land based, although sections would parallel rivers and streams.

> *E: Length.* National scenic trails shall be extended trails, usually several hundred miles or longer in length.

The entire route of the Coronado expedition is approximately 1,400 miles in length.

> *F: Continuity.* National scenic trails should be continuous for the duration of their length.

Development of a continuous trail along the route of the Coronado expedition could pose major problems. Most of any potential route is on private land. The percentage of private land is greater on the eastern half of the route, but even in Arizona and New Mexico there are large areas of private and tribal lands that would have to be crossed. In some sections, public and private lands are so interspersed that establishing any long sections of trail would be difficult without at least obtaining easements across the privately owned sections. Trails on tribal lands can conflict with religious sites. Establishing a continuous trail would require extensive coordination among federal, state, and local agencies, American Indian tribes, and many private landowners. Although difficult, other national scenic trails are being successfully established across many miles of land that were in private ownership when the trail was authorized by Congress.

In summary, the Coronado expedition route does not meet the criteria for a national scenic trail, Key eligibility criteria A, B, and F are not met.

ANALYSIS OF NATIONAL TRAIL FEASIBILITY AND DESIRABILITY

If a trail is found to be eligible for designation as a national scenic trail or national historic trail under the National Trails System Act, a determination is also made regarding the feasibility and desirability of such designation, as required by section 5(b) of the act. Because the Coronado expedition route was not found eligible for designation, a feasibility and desirability analysis was not done. If future research results in identification of the route and its national trail eligibility is reevaluated, such an analysis will need to be completed.

CORONADO EXPEDITION COMMEMORATION ALTERNATIVES

As discussed above, the Vázquez de Coronado expedition has national and international significance. Although the route does not meet the criteria for national trail designation and administration, other options for commemorating the expedition should be considered that transcend current limitations brought about by the need to determine the actual expedition route. The following alternatives were developed to present possible ways to commemorate and interpret the expedition and promote recognition of its national importance. They are organized and discussed separately in this document for clarity and to present distinct options to the public and Congress, but elements from different alternatives could be combined. No alternative is identified as preferred. On the basis of this document and public response, Congress may chose to enact legislation to implement one or more of the alternatives or a combination of the alternatives, or take no action.

All alternatives (except no action) are intended to give greater national recognition to Coronado's entrada and the American Indian cultures it contacted, to increase public awareness and appreciation, and to coordinate separate activities being carried out in the five-state area to research, interpret, and commemorate the expedition. NPS participation varies in the alternatives from a major role to "no action." The routes and sites associated with various side trips taken by Coronado's lieutenants should be considered potentially eligible for inclusion in any of these alternatives whenever feasible.

Any action taken on this Coronado study should be closely coordinated with other actions taken to commemorate Spanish colonization in America. In 1988, Congress requested a study of alternatives to commemorate Spanish colonization in New Mexico; that study is now being done by the National Park Service. Any agency or organization undertaking actions for either study should work closely with Hispanic and American Indian communities, whose cultural heritage is closely tied to the story of Spanish exploration and settlement in the United States. In implementation of any research or commemoration alternative about the Coronado expedition, the possibility of joint programs with the government and people of Mexico should be considered.

ALTERNATIVE A: CORONADO EXPEDITION RESEARCH COMMISSION

Concept

Under alternative A, a Coronado expedition commission would be established by congressional legislation. The commission would be composed of experts in fields such as archeology, history, ethnography, and cultural geography. Its purpose would be to coordinate, analyze, synthesize, and publish additional in-depth research to identify the route of Coronado and his army as accurately as possible.

One of the greatest difficulties in confirming a route for the expedition is a lack of hard evidence that ties the written record to known points on the ground. The commission's efforts would emphasize archeological field research, but it would also include research and analysis of additional historical evidence and appropriate ethnographic data collection. The intent would be to locate additional sites and key corridors that are essential to identifying a route.

An example would be field archeology to identify the location of Chichilticalli, where the expedition rested before moving north to the Mogollon Rim in Arizona.

The commission also would consider support of any research with reasonable potential of more accurately determining the expedition route in the United States. Such research could include retranslation and linguistic analysis of original Spanish documentation, ethnographic studies of American Indian oral history, studies of the expedition route in Mexico, or studies of routes of other Spanish explorers and American Indian trails. Analysis of new and existing information would include a mechanism by which the commission and scholars could directly network and interact.

Funding for the research would be provided by the government, or the commission would be authorized to raise funds from the private sector. However, most of the work probably would be done through coordination of the efforts of nonfederal entities and through issuance of contracts with recognized scholars and independent archeological research firms. All research efforts would be coordinated with state archeologists and state historic preservation offices. The commission would be directed to recommend to the secretary of the interior that the route's national historic trail eligibility, feasibility, and desirability be reevaluated if research revealed enough new data for a more precise definition of the expedition route.

In addition to its primary research focus, the commission would assist federal, state, and local agencies, private organizations, and American Indian tribes in the interpretation of Coronado's expedition and the exchange and conflict between the American Indian and Spanish cultures. The commission would be directed to prepare and distribute interpretive materials on the Coronado expedition and to recognize confirmed Coronado expedition sites. It also would provide technical assistance in planning, design, and production for cooperating institutions on interpreting the Coronado story. Representation on the commission by respected members of American Indian and hispanic groups could facilitate the interpretive program and provide a bridge where needed between researchers and the trail corridor communities.

The legislation establishing the commission would specify that its research be completed in five years. The commission's final report to Congress would include recommendations for additional efforts to commemorate and interpret the expedition, identification of a national symbol to designate Coronado sites, and a recommendation regarding the need to reevaluate eligibility for designation as a national historic trail on the basis of additional research.

Analysis

Research conducted under alternative A would increase scholarly knowledge of Coronado's expedition and related sites and provide an extensive data base for use by educators and students. This alternative also would offer an opportunity to reevaluate Coronado's route under the criteria for a national historic trail if new data indicated that a new conclusion was warranted. The commission to be established under this alternative would be useful in coordination of several research projects regarding various aspects of the Coronado expedition that are underway or planned. Such a commission could require significant federal investment in research for a limited period. Funding would also be needed for interpretive publications and for providing technical assistance on interpretive needs for cooperating

institutions. Implementation of this alternative would cost about $1 million. This estimate is based on the funding authorization for the DeSoto Expedition Commission.

To accomplish the commission's goals, a partnership would be necessary between federal, state, and local agencies, the private sector, and American Indian tribes. This partnership would have a limited time frame, with responsibilities being passed on to state and local agencies and American Indian tribes. This alternative would retain the possibility of national historic trail designation.

ALTERNATIVE B: NATIONAL HERITAGE CORRIDOR

Concept

A national heritage corridor like that proposed under alternative B is established by Congress but is unlike a traditional national park, national trail, or national historic site. A national heritage corridor is not a wide national trail. There usually is a strong tourism and economic development objective for a national heritage corridor, and resource types and management objectives tend to be much more multifaceted than for a national historic trail.

Under this alternative, the national heritage corridor would be managed to preserve and interpret significant cultural and natural resources and sites in a broad area, but with limited federal involvement. There would be no federal administering agency and no land acquisition by the federal government; the corridor would be managed by state and local governments and private landowners, probably with coordination by an appointed commission authorized by Congress. The commission would define the width of the corridor after legislative authorization. Such a commission typically develops a general plan for the corridor but has no power to compel its implementation. The commission would not own or manage land, regulate activities, or enforce mandates. The objectives of the commission's plan would be accomplished only if the people, businesses, and governments in the corridor became committed partners on behalf of the area. Federal funding for operating a heritage corridor commission is usually contingent on a nonfederal match.

This alternative would include identification and development of short hiking or horseback trails intended to re-create an experience similar to that of Coronado's expedition. A designated federal agency would provide technical assistance to states in developing state historic trails where the route is substantially known. Although creation of a national heritage corridor is included here as an alternative concept for consideration, it would be best if a feasibility study was conducted before creation of such a corridor. The study could be similar to NPS special resource studies for new areas. The Park Service is currently working on clarifying the definitions and criteria for such partnership concepts.

Analysis

Alternative B provides for recognition of the historical and cultural significance of Coronado's route without requiring major federal action. It places a priority on interpreting a "broad" corridor with all significant resources addressed. A network of roads would be identified to connect existing and future significant commemorative and archeological sites

associated with the Coronado expedition. The comprehensive interpretive program that would be developed and implemented under this alternative would increase public awareness and understanding of the expedition and of cross-cultural impacts and exchange between the Spanish and American Indian cultures. Emphasis also would be placed on the contribution of the Spanish heritage to the United States.

To accomplish the goals of this alternative, development of extensive partnerships with state, local, and other federal agencies would be necessary, as would grass-roots initiatives. Visitor contact and interpretation would take place at state and local facilities and at existing visitor contact centers of the National Park Service, the Forest Service, and the Bureau of Land Management. Construction of additional interpretive waysides in cooperation with others might be recommended.

Commemoration and interpretation would be emphasized over preservation or research. Visitors could get the best comprehensive overview of themes of the Coronado expedition and its effect on 16th century American Indian culture, and the Spanish heritage of the United States. Existing interpretive programs conducted by tribes, by private enterprises, or by local, state, and federal government agencies could be integrated into this project.

Of the alternatives described, alternative B, with the national heritage corridor option, would require the most coordination and grass-roots support. Extensive planning would be needed, and a significant effort by the parties involved would be necessary. While this would be the most complicated option, it could also be the most responsive to local needs and desires. It would provide a greater opportunity for visitor enjoyment and a comprehensive recreational experience.

Implementation of this alternative would require a long-term commitment by all parties involved, and it could be the most costly to implement successfully. Completion of the heritage corridor plan could cost about $500,000 in federal funds. This estimate is based on funding authorized for other heritage corridor commissions. Implementation actions and federal technical assistance would add to this cost and could continue for many years after completion of the plan.

Coordination of activities in such a large area would require extensive and complex efforts. The national heritage corridor concept generally has been applied to smaller areas with densely concentrated linear resources. This alternative includes broad objectives for economic development that go well beyond the need for commemorating and interpreting the Coronado expedition. Because of the scarcity of and great distances between known Coronado sites, the heritage corridor concept may lack strong thematic and physical cohesion, and it might not attract significant visitor interest or widespread grass-roots support.

ALTERNATIVE C: INCREASED NATIONAL PARK SERVICE INTERPRETATION AND COMMEMORATION

Concept

Alternative C includes enhancement of interpretation of the Coronado expedition at existing national park system units such as Coronado National Memorial, Grand Canyon National

Park, Petrified Forest National Park, El Morro National Monument, Pecos National Historical Park, El Malpais National Monument, and Lake Meredith Recreation Area. Interpretive programs at these NPS areas and at related sites would be coordinated to tell a single complete story while avoiding duplication. Coronado National Memorial staff would have a major role in coordinating this comprehensive interpretive program. At each site, visitors would get a brief overview of the entire Coronado expedition story and in-depth interpretation of one part of the story best represented by that particular site.

In addition to telling the story more fully within the national park system, the National Park Service would cooperate with other entities managing Coronado sites and direct visitors to those areas for additional interpretation. The opportunity to experience a variety of highly significant Coronado expedition sites could greatly enhance visitors' sense of this phase in American history.

As a part of this alternative, the potential for adding a new unit or units to the national park system could be explored so that the story of the Coronado expedition and its effects on 16th century American Indians could be commemorated and interpreted more fully. A separate special resource study should be completed on any proposed new area to ascertain if the area meets NPS standards for significance, suitability, and feasibility. All the sites with Indian pueblos or villages most likely to be considered for inclusion in the national park system have fallen into ruins; thus, visitors would have to imagine what the pueblos and villages must have looked like during the expedition. However, a number of natural features remain relatively unimpaired. Sites also could be evaluated as to their eligibility for the National Register of Historic Places or their suitability as national historic landmarks.

Analysis

Alternative C would give visitors a comprehensive overview of the major themes of the Coronado expedition. They would have increased opportunities to visit and experience sites related to the expedition and to learn about its effect on 16th century American Indians. Depending on how many sites people had the interest and time to visit, they could receive either a fairly complete or a rather fragmented understanding of the expedition. Scholarly knowledge would be increased somewhat through research conducted by the National Park Service to further interpretation and preservation goals for existing or new park areas.

Any sites added to the national park system would receive balanced interpretation, preservation, and research. However, this alternative would not be broad in scope for any of these activities, and addition of new sites to the national park system may not be suitable or feasible. A few significant sites would be interpreted, but the overall route would be emphasized less than in the other alternatives.

Alternative C would primarily make use of existing infrastructure and management, and it would facilitate coordinated interpretation in NPS areas. Partnerships would be emphasized less than under other alternatives. If no new park units were established, this alternative would be relatively easy and cost-effective to implement. It is estimated that $750,000 would be needed to enhance museum and wayside exhibits and for an audiovisual production. A new park area could be controversial and very expensive to establish. Costs for a new park (or parks) cannot be estimated at this time; costs would be addressed in a special resource

study if this alternative was selected. This alternative would supplement national recognition and regional emphasis offered at the Coronado National Memorial on the U.S.-Mexican border in Arizona.

ALTERNATIVE D: STATE-COORDINATED COMMEMORATION

Concept

Under alternative D, the five states would develop a program of coordinated commemoration and interpretation of the Coronado expedition. State and local agencies and the private sector would be encouraged to create ways of collectively commemorating the expedition and to coordinate interpretation throughout the area. The program probably would be coordinated by a separate agency, commission, or private group; possibly a private or quasi-public foundation could be established for that purpose. The federal government's role would be limited to initial coordination and possibly some technical assistance. There would be no changes in site ownership or management.

If possible, a symbolic highway route broadly paralleling the general corridor traveled by Coronado and his expedition could be identified and marked. The route would provide access to related 16th century American Indian sites, and interpretation would be provided. An example of this type of arrangement is the Lewis and Clark Trail highway, where the states collectively coordinate an auto tour route. Interpretive media such as publications and audio tapes would be developed to guide visitors in traveling all or a portion of the route. Sites open to public use would be identified in publications and maps, and some additional signs or orientation exhibits could be developed.

Analysis

Interpretation would be emphasized over preservation or research under alternative D. Resource preservation efforts might increase as an indirect result of enhancing public awareness of the significance and value of the Coronado expedition. Original research on the Coronado expedition would not be a prerequisite to implementation of this alternative; therefore, no significant increase in scholarly knowledge would be likely to occur.

This alternative would promote broad recognition of the role of the Coronado expedition in United States history. Visitors would gain a greater understanding of the significance of the Coronado expedition and its effects on American Indian cultures than they receive now through state, federal, and local activities. Existing interpretive programs conducted by American Indian tribes, the private sector, and local, state, and federal government agencies would be incorporated into the program.

Extensive coordination among state governments would be necessary in alternative D, but it would be easy to implement and the cost to the federal government would be relatively low. It is estimated that federal technical assistance to the states would cost about $250,000. The auto tour route, if marked, could require adjustment or relocation should future research confirm new sites or expedition routes.

ALTERNATIVE E: NO ACTION

Concept

Under a no-action alternative, existing commemorative and interpretive programs and those planned by others would continue to be implemented. No additional action would be taken by Congress or the National Park Service to specifically commemorate the Coronado expedition, except as might be appropriate within other existing or proposed programs. Portions of the expedition route would continue to be interpreted by the National Park Service, the Forest Service, the Bureau of Land Management, state organizations, local entities, and the private sector. Existing interpretive programs and activities would continue in the five states through which the Coronado expedition passed.

A Spanish heritage program that will feature interpretation of the expedition is being developed in Arizona by district offices of the Forest Service and the Bureau of Land Management. This effort is similar to the heritage corridor concept, but it is limited to the two agencies and to the southeast Arizona portion of the route. While the existing Coronado Scenic Highway in Arizona may not provide views of the actual route of the expedition, it does offer scenic vistas overlooking some of the types of terrain crossed by the expedition.

Some additional interpretation of the expedition by the various states is being planned as part of the Columbus Quincentennial program in 1992, and a nongovernment effort is underway to create a private nationwide organization dedicated to the Coronado expedition. This organization will model itself after other trail organizations such as the Oregon-California Trails Association and the Santa Fe Trail Association.

Analysis

While the ongoing interpretation of research for the Coronado expedition is not well coordinated, it does represent significant initiative by several groups. In some cases, interpretation is repetitious or contradictory. Certain segments of the route are being ignored while other segments receive too much emphasis. Except for the Coronado National Memorial in Arizona, there is no national recognition of the expedition. There is no in-depth, centrally located interpretation of the entire Coronado expedition and its effects on 16th century American Indian cultures and on Spanish exploration and settlement. The significant additional field archeology needed to research additional Coronado sites is unlikely to be done without federal assistance, or accomplishing the work is likely to take many more years. No additional federal expenditures would be required under the no-action alternative.

ENVIRONMENTAL CONSEQUENCES

The alternatives presented in this report are conceptual; thus, the potential consequences of the alternatives can be addressed only in a general way. The National Park Service has considered the cumulative impacts of these alternatives and has determined that at this general level, there would be no significant cumulative impacts. Should any of the action-oriented alternatives be implemented, specific environmental consequences, including cumulative impacts, will be evaluated during any necessary management planning or subsequent development planning.

ALTERNATIVE A: CORONADO EXPEDITION RESEARCH COMMISSION

Impacts on Natural and Cultural Resources

Under alternative A, impacts on vegetation, wildlife, soils, prime farmlands, wetlands, air quality, and water quality would be negligible. Archeological investigations would involve small, localized areas on a short-term basis. Soil banking and backfilling would encourage vegetation regeneration.

Research programs initiated under this alternative would help to identify previously unknown or undocumented resources related to the Coronado expedition. Agencies could focus preservation efforts on protection of important archeological sites. Interpretive programs would help to reduce vandalism.

Impacts on Socioeconomic Environment

Regionally coordinated research directed specifically toward the Coronado entrada would help to eliminate piecemeal and nonsystematic data collection. It also would provide valuable new information to be included in an extensive, coherent data base for long-term use by scientists, educators, and students. Discovery of new sites would enrich the Coronado story and provide an impetus for interpretive, educational, and scientific programs. Recording of traditional tribal histories of the entrada and its impact on American Indians would provide an enriched, more accurate perception of the past.

Technical assistance programs would enable state and local government agencies and private groups to develop unified, factual, compelling interpretive programs, using existing institutions. While fewer recreational opportunities would be available for route enthusiasts than other alternatives would offer, visitors would gain an enhanced understanding and appreciation of the importance of the expedition.

Actual sites and artifacts are more compelling than are commemorative markers; they significantly improve the quality of visitors' experience. Conversely, lacking a designated tour route to follow, visitors would have difficulty retracing the general route of the Coronado expedition.

Initial funding provided by the government or the private sector for research would feed monies back into local communities. Some additional economic benefits would be derived from public involvement in increased interpretation and education programs. Overall, coordination and interpretation would be in the context of state and local agencies' ongoing programs; additional funding probably would not be required. Ownership and current land uses would be unchanged. No land acquisition is proposed; thus, private lands would not be withdrawn from local tax rolls.

ALTERNATIVE B: NATIONAL HERITAGE CORRIDOR

Impacts on Natural and Cultural Resources

Because federal involvement would be minimal under alternative B, resource protection would be sporadic. Resource protection and management by state and local governments and by private individuals probably would continue at current levels. Damage to unprotected archeological resources might result from increased visibility and interest.

Construction of short hiking or horse trails could affect soils, vegetation, wildlife, visual quality, water quality, and archeological sites. However, adverse resource impacts would be minimal because of the relatively limited extent of land potentially altered and because trail alignments can be adjusted to avoid environmentally or culturally sensitive areas. Trails probably would be constructed along existing routes already developed for public use. Trail corridors would be surveyed before development to determine potential effects on threatened or endangered plant and animal species or on archeological and ethnographic resources or cultural landscapes. Soils would be compacted by visitors' use of trails; this would result in some erosion and increased runoff. However, trail construction can be beneficial; trails define travel routes and channel visitors away from sensitive areas.

Construction of interpretive waysides and signs would have a minimal incremental effect on natural and cultural resources. These small, simple facilities probably would be built within existing rights-of-way or disturbed areas. Ambient noise and dust levels might increase temporarily.

Impacts on Socioeconomic Environment

Landownership, current land uses, and the local property tax base would remain unchanged under alternative B.

The heritage corridor would offer visitors a broad-spectrum, comprehensive program of important educational and recreational opportunities. Existing roadways connecting major sites would enable visitors to experience much of the sort of terrain covered by the expedition. If roads needed to be upgraded to improve visitor access to important sites or hiking/horse trails, impacts would be assessed in a separate environmental document.

Recreational use of the corridor probably would increase over time. This might slightly increase state and local expenditures for visitor services, but the overall effect would be

minor. Hiking and horse trails probably would not attract significant numbers of users, but recreational opportunities along those trails would complement other community resources.

The identification of recreational or interpretive resources on private lands could result in a loss of privacy for some landowners. Integration of American Indian interpretive programs into this project would furnish a more factual view of the entrada and increase understanding of the cultural interaction. However, this alternative probably would result in less major scientific research than would alternative A.

Use of existing facilities for visitor contact and interpretation would lessen costs associated with this alternative. Development would be responsive to local needs, but coordination of many interested parties over time would be costly.

Development of local interpretive opportunities, combined with efforts to protect existing sites, could result in economic benefits. However, these actions would not be expected to make a major contribution to the economy of any area along the route or any particular state. On a local level, institutions or persons involved in activities related to interpretation of the entrada might benefit economically.

ALTERNATIVE C: INCREASED NATIONAL PARK SERVICE INTERPRETATION AND COMMEMORATION

Impacts on Natural and Cultural Resources

Impacts on natural and cultural resources within existing park areas would be negligible under alternative C. Small increases in visitation might cause more "wear and tear" on cultural and natural resources; however, most NPS areas along the route have the capacity to accommodate some increased visitation without incurring major resource degradation. If new units were added to the national park system, protection of natural and cultural resources generally would be increased. Any proposal for a new unit would be addressed in a separate environmental document. Damage to natural and cultural resources outside park areas would continue.

Impacts on Socioeconomic Environment

There might be modest increases in visitation under alternative C, with subsequent economic benefits to local communities. Establishment of new national park system units could remove land from local tax bases, but this might be partly offset by income from increased tourism. Otherwise, landownership, current land uses, and the local property tax base would remain essentially the same.

A more unified interpretive program would be presented at low cost to the public, but it would not be linked as closely to other nonfederal programs as the programs proposed in other alternatives.

ALTERNATIVE D: STATE-COORDINATED COMMEMORATION

Impacts on Natural and Cultural Resources

Alternative D would have minimal effects on natural and cultural resources. Small increases in visitation to local sites might be expected, but resources would not be significantly affected. Highway markers and interpretive waysides would be built in existing rights-of-way.

Impacts on Socioeconomic Environment

Communities along the symbolic route proposed under alternative D might experience a modest increase in visitation and resulting economic benefits, but the benefits would be local and sporadic. State governments would bear the cost of coordinating and administering the program. Over time, costs would decrease, with remaining costs generally related to replacement of interpretive media.

Research would continue to be limited and directed toward compliance with laws and regulations rather than toward scientific inquiry into the Coronado expedition. Visitors' travel experiences would be enriched by available information presented in roadside markers and media.

ALTERNATIVE E: NO ACTION

Impacts on Natural and Cultural Resources

Under the no-action alternative, protection of natural resources and significant historic sites and archeological resources would continue to be uneven and uncoordinated, and in most areas funding and public education would be inadequate. There would be few additional impacts on soils, vegetation, wildlife, or threatened or endangered species resulting from development activities or visitor use in areas now managed by federal and state agencies. Archeological site preservation and natural resource protection would be related to ownership rather than significance.

There would be no coordinated research, protection, stabilization, or management of archeological sites. Sites would continue to be subject to vandalism and inappropriate uses, and resources could be destroyed or irretrievably lost because the individual landowner's interest in resource protection could be limited. Publicity regarding Coronado's entrada (linked to planned celebrations to commemorate the landing of Columbus in the Americas in 1492) might encourage unauthorized, unscientific exploration of sites and their possible destruction, as well as possible trespass on American Indian lands. However, such publicity also would increase public awareness of the Coronado expedition and related sites.

Lacking funding and direction, various archeological programs would continue to be basically compliance actions, focusing monies and energy into research unrelated to Coronado.

Impacts on Socioeconomic Environment

Interpretive efforts carried out on a local basis would focus on the local Coronado resources, but it would be difficult for visitors to appreciate and understand the significance of the larger expedition and how it affected indigenous American Indians.

Except for local actions to provide visitor facilities and interpretive programs, the no action alternative would have no overall effect on local economies, landownership, or transportation systems. Lack of coordination of archeological and history research would contribute to overlapping, redundant, and/or spotty, uneven research.

Visitors' understanding and appreciation of the significance of the Coronado expedition would continue to be limited, and few developed recreational opportunities would be available for route enthusiasts. Interpretive programs would continue to be focused on widely scattered and conflicting commemorative sites instead of actual entrada sites.

Alternative E would have minimal additional effects on landownership and land use. However, some visitors seeking to explore potential Coronado routes and sites might trespass on private lands, especially on Indian tribal lands.

CONSULTATION AND COORDINATION

CONSULTATION

During the course of this study the National Park Service consulted with the following agencies and organizations:

Forest Service, U.S. Department of Agriculture
- Southwest Regional Office
- Apache-Sitgreaves National Forest
- Coronado National Forest

Bureau of Land Management, U.S. Department of the Interior
- Safford District Office

State Historic Preservation Officers
- Arizona, Kansas, New Mexico, Oklahoma, and Texas

Local Colleges and State Universities

About 60 experts in the study of Vázquez de Coronado and related 16th century culture were consulted during the history/archeology research for this project. Several NPS study team members attended a conference sponsored by the Panhandle Plains Historical Museum in Canyon, Texas, in August 1990 to discuss the Coronado route in that area. NPS Coronado study team personnel also attended a Coronado symposium in Lyons, Kansas, in April 1991.

The National Park Service published a newsletter in August 1990 describing the study and requesting input before preparation of this report. Public scoping meetings were held in September 1990 in all five states, at Tucson, Arizona; Hutchinson, Kansas; Albuquerque, New Mexico; Guymon, Oklahoma; and Amarillo, Texas. Major areas of concern identified during this scoping included the need to do something to commemorate the expedition, the economic development potential of a national trail, disagreement about the route of the expedition, and the need for more field archeology to confirm the historic corridor. The draft study report was issued for public review and comment in September 1991.

American Indian tribes along the Coronado route and those with historic ties to lands crossed by the expedition were notified of the study during project initiation and invited to participate in public scoping meetings. Written comments were received from several American Indian groups, and National Park Service representatives met with representatives of several tribes along the expedition route.

PUBLIC COMMENT

In April 1991, members of the study team attended the Coronado Trail Symposium in Lyons, Kansas, where they presented findings of the national trail study and the commemorative alternatives. More than 125 persons attended that meeting, which was sponsored by the Coronado Trail Association.

The *Coronado Expedition National Trail Study and Environmental Assessment* was available for public comment for a 60-day period ending September 30, 1991. Public meetings were held in early September in Sierra Vista, Arizona (14 persons attended); Gallup, New Mexico (no attendance); Amarillo, Texas (34); Boise City, Oklahoma (4); and Lyons, Kansas (16).

Twelve letters were received from individuals, including one from two people. A letter was received from the president of the Coronado Trail Association, which was established early in 1991 and has approximately 205 members. Six of the people who wrote letters also attended the public meetings.

Written comments came from five state agencies, three federal agencies, one American Indian tribe, and one museum. A petition was received that had been signed by representatives of chambers of commerce from six counties in southern Arizona.

Both at public meetings and in written comments, sentiment was strongly expressed in favor of including Mexico in jointly conducted research on and commemoration of the Coronado Expedition. Archeologists working in Arizona expressed opinions that accurate determination of the route in southern Arizona depends on needed route research in Mexico. Alternative A (Coronado Expedition Research Commission) has been revised to include the option of permitting research on the Mexican section of the route, if this research could shed light on the United States section. The introduction to the section on alternatives has been rewritten to include consideration of joint commemoration with the Mexican government and people, regardless of the alternative.

The map showing the zone of possible routes was criticized as having placed too much emphasis on uncertainty about the route. That map has been modified to eliminate some routes that are generally discredited among the academic community. On the revised map, the routes of different expedition groups are differentiated, as are the outgoing and return route zones.

Alternative A was the alternative most frequently mentioned as favored in letters and public meeting comments in support of a particular alternative. That alternative was preferred by 12 of 26 persons who spoke at public meetings (6 of those speakers also wrote letters in favor of the alternative).

Twelve letters received favored Alternative A; six of those were from persons who also spoke at public meetings. Some letters, especially those from Coronado scholars, mentioned specific requirements that the writers said should apply to any research commission, such as international involvement with Mexico and a life span of more than five years for the commission. Some also made specific recommendations for types or areas of research, methods by which researchers should network, methods of staffing the commission, and kinds of expertise members should have. Alternative A has been rewritten to reflect many of those comments; however, detailed prescriptions have not been included for specific types of expertise of commission members or researchers or for specific makeup of the commission.

The conclusions regarding national trail eligibility were generally accepted, although disappointment was often expressed. Most letters and comments did not address that issue, but four letters and two meeting participants emphatically agreed with this decision. One commenter, repeating at a public meeting the comments also made in a letter, agreed with the

finding, but criticized the National Trails System Act criteria as being deficient to cope with a "trail" of this nature. Two people said they thought there was no reason Bolton's route for the Coronado expedition could not be designated as *the* national historic trail (one repeated this thought in writing), and one person said the National Park Service could designate the historic trail route because several of the proposed routes were, for the most part, identical or very close.

A petition from six chambers of commerce urged the National Park Service to designate the route up the San Pedro valley in Arizona as part of a national trail. Both in a public meeting and in writing, the president of the Coronado Trail Association was critical of the process used to determine the expedition route during the history study phase of this project. That commenter suggested a need for more effective networking of scholars. The eligibility finding is based on the National Trails System Act, and no changes have been made to that section of the report. The suggestion for better networking during study of trail history has been included in Alternative A.

Comments were received regarding the relationship of American Indians with research on and commemoration of the expedition. Comments from American Indian groups supported commemoration of the expedition as a significant historic event, provided American Indian tribes and organizations would be included as partners or consultants. The Zuni tribal council expressed concern over potential conflicts with religious sites and impacts of tourism. Tribal officials expressed their desire to be consulted early should any action be taken leading to legislation or implementation of any alternative. No comments were received in opposition to commemoration of this expedition because of its effects on American Indians. However, the study team is aware of the current controversy surrounding the Columbus quincentenary and American Indian cultures. The study report reflects the view that commemoration of the Coronado expedition should include recognition of all aspects and viewpoints of the interaction between the Spanish and American Indian cultures and the subsequent cultural development of the region.

A variety of other comments were received. Most additions and corrections to the text suggested in comments were included in the final study report. A few comments were made on alternatives other than alternative A. One agency favored Alternative D (state-coordinated commemoration). Two commenters expressed strong opposition to alternatives B (national heritage corridor) and C (increased NPS interpretation and commemoration), as well as to alternative D. One person suggested combining alternatives A and C; suggestions that alternatives A, B, and C be combined were received from one individual and one agency. None of the people or agencies that commented said they were in favor of Alternative E (No Action).

APPENDIX A: CORONADO NATIONAL TRAIL STUDY ACT

COPY

TITLE II–CORONADO NATIONAL TRAIL STUDY

SEC. 201. SHORT TITLE

This title may be cited as the "Coronado National Trail Study Act of 1988."

SEC. 202. FINDINGS

The Congress finds that—

(1) Francisco Vasquez de Coronado led an expedition from Compostela on the Southwest Coast of Mexico, into the American Southwest in search of the legendary Seven Cities of Cibola between 1540 and 1542;

(2) Coronado's expedition of approximately 300 Spanish soldiers and 1,000 Indian allies and servants marched through the State of Arizona, then through the States of New Mexico, Texas, Oklahoma, and Kansas;

(3) Coronado and his troops found Pueblo Indian settlements, including the Zuni villages of western New Mexico, Acoma along the Rio Grande River, as far north as Taos, and east to Pecos, as well as those of the Hopi in Arizona and Plains groups in Texas, Oklahoma, and Kansas; and

(4) members of the Coronado expedition became the first Europeans to see the Grand Canyon in Arizona, the Palo Duro Canyon in Texas, and many other Southwestern landmarks.

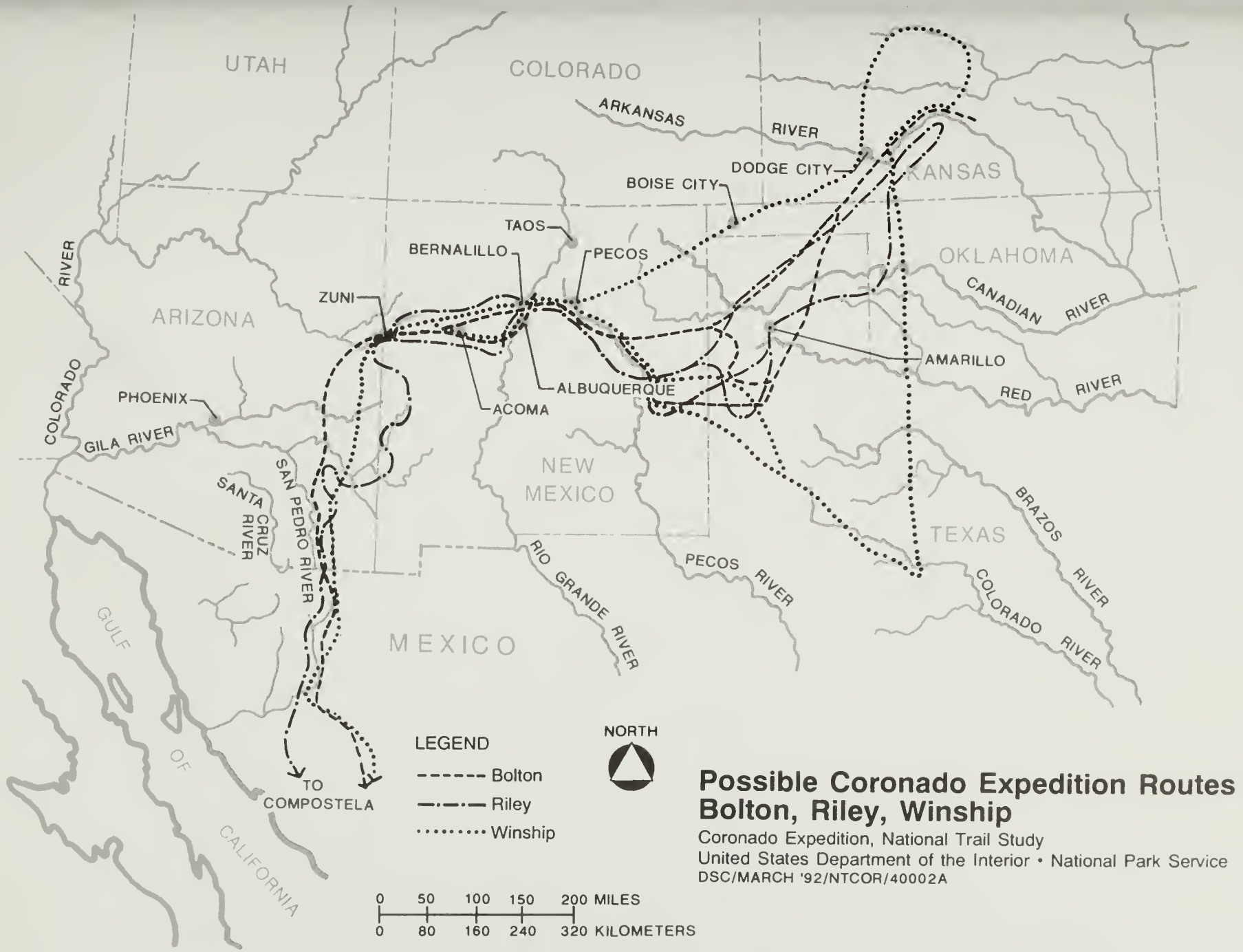
SEC. 203. DESIGNATION OF TRAIL

Section 5(c) of the National Trails System Act (82 Stat. 919; 16 U.S.C. 1244 (c)) is amended by adding at the end thereof the following new paragraph:

"(32) Coronado Trail, the approximate route taken by the expedition of the Spanish explorer Francisco Vasquez de Coronado between 1540 and 1542, extending through portions of the States of Arizona, New Mexico, Texas, Oklahoma, and Kansas. The study under this paragraph shall be prepared in accordance with subsection (b) of this section. In conducting the study under this paragraph, the Secretary shall provide for (A) the review of all original Spanish documentation on the Coronado Trail; (B) the continuing search for new primary documentation on the trail, and (C) the examination of all information on the archeological sites along the trail."

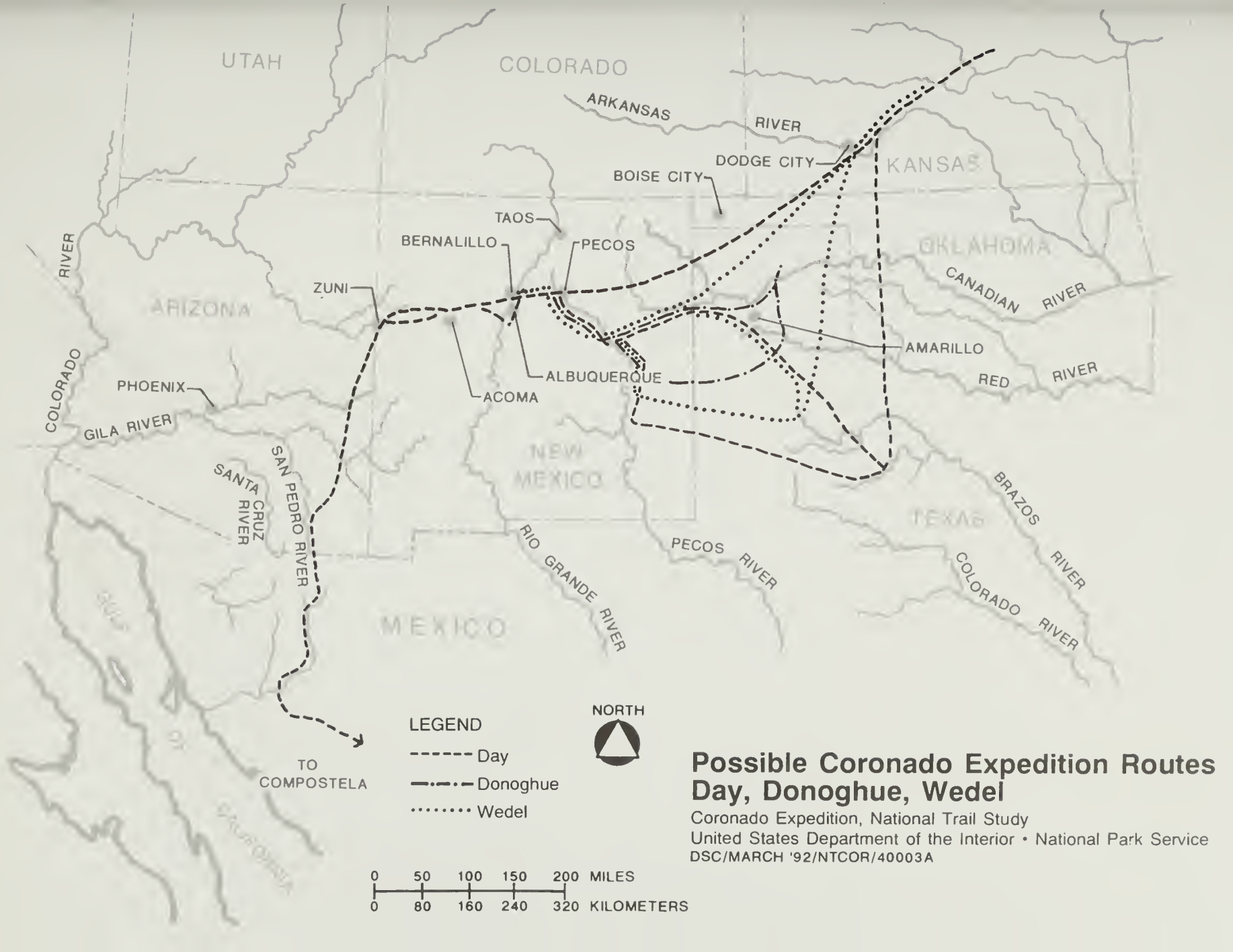
COPY

APPENDIX B: POSSIBLE CORONADO EXPEDITION ROUTE MAPS



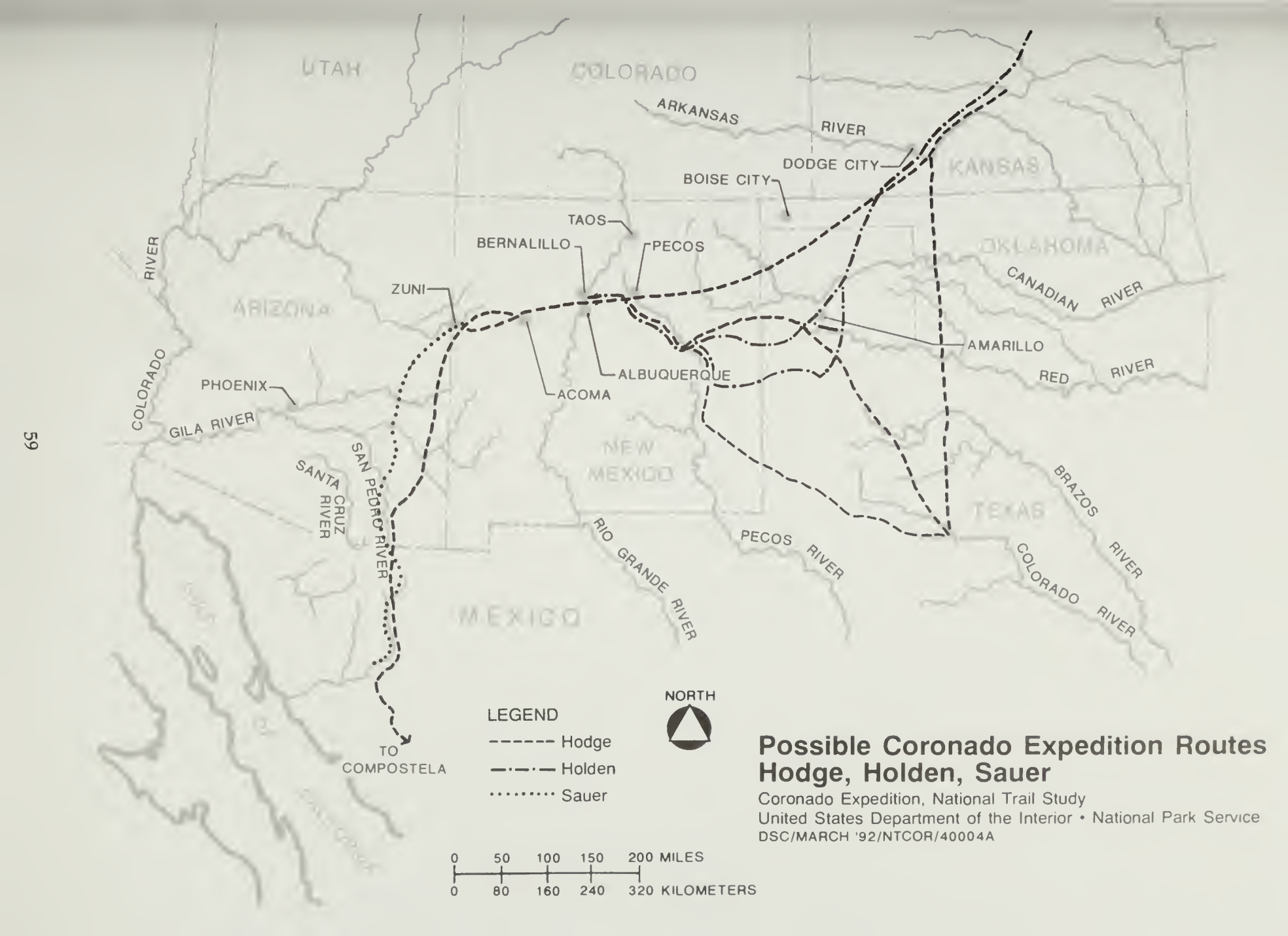
Possible Coronado Expedition Routes Bolton, Riley, Winship

Coronado Expedition, National Trail Study
United States Department of the Interior • National Park Service
DSC/MARCH '92/NTCOR/40002A



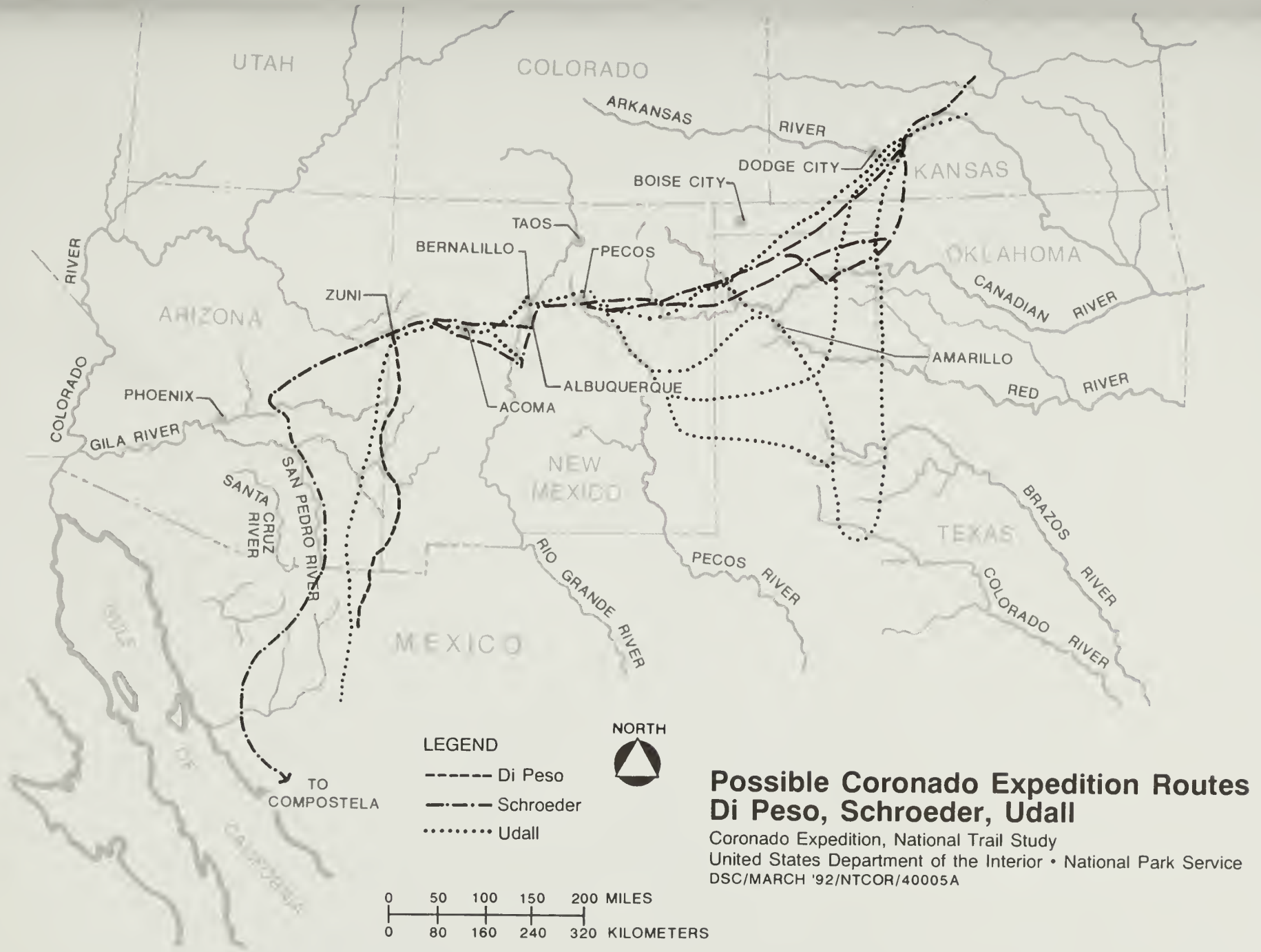
Possible Coronado Expedition Routes
Day, Donoghue, Wedel

Coronado Expedition, National Trail Study
United States Department of the Interior • National Park Service
DSC/MARCH '92/NTCOR/40003A



Possible Coronado Expedition Routes Hodge, Holden, Sauer

Coronado Expedition, National Trail Study
United States Department of the Interior • National Park Service
DSC/MARCH '92/NTCOR/40004A



Possible Coronado Expedition Routes Di Peso, Schroeder, Udall

Coronado Expedition, National Trail Study
United States Department of the Interior • National Park Service
DSC/MARCH '92/NTCOR/40005A

APPENDIX C: CULTURAL SITES

There are numerous 16th century sites in Oklahoma, Texas, and Arizona that generally lie within the expedition corridor and that show strong similarities to sites described in the narratives. However, none of these sites offer unequivocal archeological or historical evidence of the expedition's presence. The following listing is limited to sites in New Mexico and Kansas where the route is more precisely defined and where sites can be more closely linked with the Coronado expedition.

NEW MEXICO

LA37, Hawikku (Zuni vicinity, Cibola County). Hawikku is on a low mesa stretching into the Ojo Caliente Valley, overlooking the junction of the Zuni River with Plumasano Wash. This large, irregularly shaped masonry pueblo contained perhaps as many as 800 rooms set in tiers down the slope, making it look as if there were six or more stories. Zuni peoples may have occupied this site as early as A.D. 1400.

A Spanish mission was established at Hawikku in 1629, and a church and friary built there, but the priests were killed soon after. Rebuilt and staffed by 1672, the church at Hawikku and the pueblo itself were abandoned after 1680. Most of the pueblo and mission were excavated by Frederick Webb Hodge in 1925. Today the site is a huge rock rubble mound. Low sandstone walls outline foundations and rooms of the pueblo, and eroded adobe mounds remain from the 17th century mission church and convento. Hawikku was designated an NHL in 1960 and is included in the national historic landmark documentation nomination for the Zuni-Cibola complex.

LA8758, Kechiba:wa (Zuni vicinity, Cibola County). In Zuni, Kechiba:wa means "gypsum place," from the whitish rock on which the pueblo was built. This pueblo, a short distance east of Hawikku, overlooks the agricultural lands in the Ojo Caliente Valley. The total number of rooms is estimated at anywhere from 150 to 824, and the room blocks form two or three plazas in a complex shape. A small, continuous-nave 17th century mission church (a visita of La Purisima Concepcion) and an associated convent of about five rooms occupied the eastern part of the site. Kechiba:wa may have been occupied from about A.D. 1425, but slab-type houses, perhaps representing 8th or 9th century occupation, have also been found near the pueblo. Today only ruins of this large pueblo and mission complex remain. Kechiba:wa was designated an NHL in 1974 and is included in the national historic landmark documentation for the Zuni-Cibola complex.

LA1053, Kwa:kin:a (Zuni vicinity, McKinley County). Several mounds and a few scattered ceramic sherds on a ridge overlooking the Zuni River valley less than 10 miles beyond Hawikku mark the site of Kwa:kin:a. Little is known about this "town of the entrance place," but it is suggested that the room blocks were a single story, contained perhaps 186 rooms, and were probably occupied after A.D. 1400.

LA9093, Halona:wa (Zuni, McKinley County). Halona:wa ("red ant place"), now known as Zuni Pueblo, is the only one of the Cibola sites currently occupied. Modern portions of the pueblo (Halona:wa North) are on the north side of the river, and the older pueblo (Halona:wa: South) is on the south. The contact period sites have been completely buried by later pueblo structures, although some of the prehistoric walls may have been used in the modern pueblo. Archeological excavations indicate the masonry pueblo village was of substantial size, perhaps 575 rooms. Early occupations here probably postdated A.D. 1275 for Halona:wa South and ca. A.D. 1425 for Halona:wa North.

After the pueblo revolt of 1680 and their subsequent retreat to defensible mesa tops, Zuni peoples returned to Halona:wa, abandoning the other villages. The old mission of Zuni Pueblo, built in 1629,

was burned in 1680 and rebuilt several times in succeeding centuries. This church contains striking murals of Zuni religious figures painted by renowned Zuni artist Alex Seowtewa. The pueblo is listed on the National Register of Historic Places.

LA27713, Mats'a:kya (Zuni vicinity, McKinley County). About 2 miles east of Halona:wa are the rubble ruins of Mats'a:kya, perhaps once the largest of the Zuni villages. Mats'a:kya is situated on the top, sides, and base of a large knoll near the Zuni River. This pueblo, which may have been polygonal in shape, contained an estimated 901 rooms. It was occupied from ca. A.D. 1400.

LA492, Kyaki:ma (Dowa Yalanne vicinity, McKinley County). This "house of eagles" is situated on a steep hill at the base of the sacred Zuni mountain Dowa Yalanne. Set in a protected cove, the site is bounded on the north by steep cliffs and overlooks a broad plain where two canyons open into the Zuni Valley. Now only piles of masonry rubble, Kyaki:ma was probably made up of a single linear room block built along a ridge with an adjacent square room block surrounding a deep depression. Kyaki:ma may have been only a single story in height with about 250 rooms. It was occupied after ca. A.D. 1400.

LA112, Acoma Pueblo (Acoma, Cibola County). Acoma was first visited by members of the Coronado expedition in 1541. Perched atop an isolated mesa rising 357 feet above the plains, this pueblo is about midway between Albuquerque and the continental divide. Acoma is one of the oldest continuously inhabited settlements in the United States, dating back at least a thousand years. Burned in 1599, this masonry pueblo was partially rebuilt in the 1600s and again after 1776, but is little altered from its prehistoric character, today standing one to three stories high. Between 1629 and 1641, the church of San Estevan was built along the southern edge of the pueblo by Fray Juan Ramirez. The church has been renovated several times over the succeeding centuries, and it still serves Acoma at festival time. Most of the Acoma Indians live in outlying communities on pueblo lands but return to Acoma Pueblo for ceremonial functions. The secretary of the interior designated this historic pueblo an NHL in 1960, and the church, a large impressive example of Spanish colonial architecture, was added to this listing in 1970.

The narratives mention that expedition members saw a lake and marshy area somewhere between Acoma and the Rio Grande Valley; this may have been the area that later became Laguna Pueblo.

Many of the pueblos along the Rio Grande and its tributaries were named by Coronado's group, and on occasion American Indian names were retained. Unfortunately, this nomenclature was generally unknown or was not used by later entradas. Consequently, correlation between archeological sites or existing pueblos and those Coronado visited is tenuous and controversial.

Coronado, accompanied by 30 soldiers, visited the province of Tutahaco, an area said to have eight villages. Schroeder (1990) identifies these villages as the following present-day archeological sites. None of these sites has been evaluated for National Register eligibility.

LA282, Unnamed (Socorro vicinity, Socorro County). An unnamed pueblo ruin in Socorro County consists of house mounds thought to contain about 180 rooms surrounding an open rectangular plaza that encloses two kiva depressions; middens and outlying rooms are nearby.

LA755, Las Canas Pueblo (Socorro vicinity, Socorro County). Constructed of puddled-coursed adobe with a few masonry elements, Las Canas Pueblo, a complex of room blocks, had an estimated 200 rooms. Extensive looting and erosion have badly damaged this site.

LA768, Al Lado de las Canas Pueblo (Socorro vicinity, Socorro County). A linear, eight-room masonry room block, a single large kiva, piles of masonry rubble, and a small cobblestone enclosure comprise this pueblo site.

LA283, El Barro Pueblo (Lemitar, Socorro County). This small plaza pueblo, constructed of cobblestones and adobe (and possibly jacal), contained a single circular kiva. The site was completely destroyed by a gravel pit operation.

LA286, Alamillo Pueblo (Estancia Acomilla) (San Acacia vicinity, Socorro County). This small Piro pueblo ruin showing Spanish architectural details consists of two "L" shaped house mounds around an open plaza, and a possible mission or chapel structure.

LA287, Cerro Indio Pueblo (Indian Hill Pueblo) (San Acacia vicinity, Socorro County). Another Rio Grande Valley Piro site occupied during this time (but not listed by Schroeder), this Piro pueblo, situated on a butte overlooking the Rio Grande, is a large single plaza-type pueblo with an estimated 117 rooms with various courtyard enclosures. This complex is arranged in a roughly rectangular layout. A single kiva and a linear room block appear in the plaza, and another linear room block lies to the southwest. Several catchment areas are nearby.

LA778, Pueblo San Francisco (La Joya vicinity, Socorro County). The ruins of Pueblo San Francisco consist of a cobble masonry house mound, pit structures, and an associated scatter of cultural debris.

LA774, Sevilleta Pueblo (La Joya vicinity, Socorro County). Sevilleta supposedly was named for the famous Andalusian city. Abandoned early in the 17th century, this pueblo was resettled in the 1630s, and a friary and church dedicated to St. Louis the Bishop were built here. This village was visited by a number of 16th and 17th century Spanish expeditions and became a stopping point for travelers on the Camino Real. The mission was abandoned in 1680. Spanish fleeing from the Pueblo Revolt sought refuge here as they moved south. The Spanish reoccupied the site in 1800, building a small village. Today the ruins consist of nine masonry house blocks and three kivas and midden areas, along with a chapel, church, possible convento, and corral compound. The site retains a high degree of integrity and it appears highly significant, although it has not been evaluated for National Register eligibility.

As described in the Coronado expedition narratives, the province of Tiguex consisted of approximately 12 to 14 large villages within a few leagues of one another, about half on either side of the Rio Grande. This province represented the southern division of the Tiwa-speaking Pueblo Indians, an area that encompassed both sides of the Rio Grande from near present Los Lunas to the vicinity of modern Bernalillo. The following discussion includes major archeological pueblo sites known to have been occupied during the mid-1500s. The majority of these sites are listed on the State Register of Historic Places. Most of the sites not currently listed on the National Register of Historic Places are being evaluated under a proposed thematic nomination.

LA50249, Pueblo Casa Colorado (Turn vicinity, Valencia County). This massive complex, the largest known pueblo ruin in the Southern Tiwa District, contains an estimated 500 ground floor rooms. Built of puddled adobe, the pueblo was probably multistoried. Abundant artifacts of a rich and varied nature suggest this site is one of the most important cultural properties in this area, and it is considered potentially eligible for the National Register.

LA951, Los Lentes Pueblo (Los Lunas vicinity, Valencia County). This ruin site was probably an early component of nearby site LA81. A church and parking lot have been built over the pueblo ruins. Los Lentes was clearly a puddled-coursed adobe apartment complex, roughly triangular in shape, and it probably did not contain more than 100 ground floor rooms. There appear to have been two distinct occupations of the site—prehistorically and during the period 1540–1580, perhaps as late as 1629.

LA81, Be-jui Tu-ay (Los Lunas vicinity, Valencia County). Originally this pueblo consisted of a large plaza and an adjacent rectangular house block (about 500 ground floor rooms), probably of puddled-coursed adobe in partially multistoried construction. Most of the site has been destroyed by canal and levee construction, but the abundant artifacts suggest remnants of subsurface features.

LA953, Valencia Pueblo (vicinity of Peralta, Valencia County). A modern church and residences have been superimposed on this pueblo ruin, but deeply buried structures may remain. The pueblo appears to have been a large multistoried, puddled-coursed adobe apartment complex covering a total area of approximately 75 square meters. Valencia and Be-jui Tu-ay are both considered potentially eligible for the National Register.

LA724, Isleta Pueblo (Albuquerque vicinity, Bernalillo County). Isleta (meaning islet) comes from the location of the village (before the Rio Grande changed its course) on a delta or island between the bed of a mountain stream and the river. This village supposedly still stands on or very close to the site occupied when Coronado visited this area in 1540. A church and convent were erected about 1613. Prior to 1680, Isleta's population was swelled by refugees from other pueblos that had been attacked by Apaches. Spanish settlers took refuge from the Pueblo Revolt at Isleta. The pueblo was abandoned, reoccupied, and captured by Otermin, and the Indians were taken to El Paso and re-settled there. Scattered Tigua families reassembled at the ruined village ca. 1709, and they were joined by many others who had fled to Tusayan in Arizona. By 1944 the population of the pueblo had increased to 1,334 persons. This pueblo was added to the National Register in 1975.

LA274 Sandia Pueblo (Albuquerque vicinity, Sandoval County). The Tigua Pueblo of Sandia (Spanish for watermelon) is the successor of one of the towns of the province of Tiguex of Coronado. This site was the Napeya of Oñate in 1598, and became the seat of the mission of San Francisco. In 1640 Sandia had an excellent church with a visita. At the time of the Pueblo revolt, tradition has it that many of Sandia's residents fled to the Hopi Mesas in Arizona. Otermin destroyed the pueblo in 1681, but it was rebuilt near its present site in 1748 by Fray Menchero. On refounding of the mission, the name was changed from San Francisco to Nuestra Señora de los Dolores.

LA2265, Chamisal (Albuquerque, Bernalillo County). This multicomponent site contains evidence of an Archaic campsite dating to ca. 720 B.C., which is overlaid by later occupations (A.D. 800 through 1650 and after 1820). Excavation of some of the ruins in 1979-81 revealed a vertical series of room blocks, work areas, plazas, hearths, storage cists, adobe mixing pits, water channels, and burials. This pueblo may have been one of the large Tiwa pueblos discussed in Coronado's narratives, and it is potentially eligible for the National Register as part of a proposed district (the Los Ranchas National Register District).

LA716, Pueblo Maigua (Alameda Vicinity, Bernalillo County). The low mounds of this pueblo site, which has been bisected by railroad construction, contain adobe and stone rubble and a few artifacts. The National Register status of this site has not been determined.

LA421, Alameda School Site (Alameda vicinity, Bernalillo County). This privately owned site has been variously identified as San Mattheo, Puaray, or the Alameda Pueblo of 1680. In any case, LA421 was one of the historic Tiwa pueblos occupied into the historic period and probably into the early 1600s. The mounds marking the site were hauled away for road fill, and today only a few potsherds mark its location. However, the site is considered potentially eligible for the National Register.

LA290, Alameda/Santa Catalina/Los Guajolotes (vicinity of Alameda, Bernalillo County). LA290 has been variously identified as the Tiwa Pueblo of Alameda, Santa Catalina, or Los Guajolotes (Scurlock 1982:7). Remnants of this large multistoried pueblo of adobe and stone lie buried beneath mounds of earth some distance from the Rio Grande. The site has been severely damaged by vandals, and its National Register eligibility is undetermined.

LA717, Possible Puaray Pueblo (Alameda, Bernalillo County). Scholars disagree about the location and identification of the Puaray Pueblo, but most feel that Puaray is site LA717, located between present-day Sandia and Alameda. The site, which is privately owned, has been leveled. In 1931 it was described as a medium-sized pueblo of adobe and stone rubble, reduced to a mound about 8 feet high. Analysis of the site's ceramics indicates that the pueblo was occupied from at least A.D. 1350 until the 1600s. It was one of the most important early historic Tiwa pueblos and is considered potentially eligible for the National Register.

LA288, Pueblo Corrales, El Pueblito (Corrales vicinity, Sandoval County). The large mound that comprises the privately owned site of Pueblo Corrales is buried beneath residences and farm structures and surrounded by cultivated fields. (Pueblo Corrales is also known as El Pueblito. Schroeder [1990] identifies Pueblo Corrales as the Arenal of Coronado's documents.) It is likely that the site represents a coursed adobe apartment complex containing an estimated 200 ground floor rooms. Adobe walls can be seen in some areas of the mound; there is no evidence of a plaza. Comparisons with nearby Kuaua strongly suggest that this site may have painted kivas. Pueblo Corrales is directly opposite the present pueblo of Sandia and so may represent an ancestral "sister village" of Sandia. There is little question that this site was occupied at the time of Coronado's entrada, and it probably persisted well into the 17th century. The Armijo hacienda was established on the mound at an undetermined time and was occupied by Fernando Armijo in the early 20th century. The Armijo residence was largely dismantled after 1930. This site is potentially eligible for the National Register.

LA326/LA728 Santiago Pueblo or Bandelier's Puaray (Bernalillo vicinity, Sandoval County). Several researchers suggest that Santiago Pueblo was Coofer or Alcanfor, the pueblo where Coronado spent the winters of 1540 and 1541 (Vierra 1989:3). Others identify it as Culiacan, Puaray, Tiguex (Moho), or Kuaua (Scurlock 1982:7; Schroeder 1990:3). Santiago and the adjacent site LA728 are situated on a terrace overlooking the Rio Grande valley and the Sandia Mountains. This roughly square pueblo had an enclosed central plaza with a circular kiva. The plaza was surrounded by four room block wings separated by small passageways. Site ceramics suggest an occupation span from the 1400s to somewhere in the last half of the 1600s, for the pueblo was no longer occupied in 1680.

Around 400 burials were found during the 1934–35 excavations, and artifacts include pre- and post-contact period items such as metal tools and armor. A skeleton found in the south wing of the pueblo had a crossbow bolt embedded in its chest. A separate Spanish structure, dating to the Spanish Colonial period, was southeast of the pueblo. Abandoned during the Pueblo Revolt, Santiago was reoccupied during the 18th century.

Site LA728, an isolated set of 15 graves set into an extensive sheet trash deposit, was partially excavated in 1968. The pueblo complex (sites LA 326 and 728) has been partially destroyed by first a gravel pit and then a manure dump, but the portions remaining are considered potentially eligible for the National Register.

LA54147, Unnamed Site (Bernalillo vicinity, Sandoval County). This site is the only documented example of a 16th century Spanish expeditionary campsite in the Southwest. Situated outside of Santiago Pueblo, the site consists of shallow dugouts, probably for tents or brush shelters, with both interior and exterior hearths. The dugouts were filled with soil mixed with burned corn, beans, and bone (game, birds, and domesticated sheep), potsherds, bits of charcoal, ground stone, burned adobe, and metal artifacts, including nails, clothing attachments, and armor. A Mesoamerican blade fragment of Pachuca obsidian from the Valley of Mexico was also found here. Datable ceramics give a possible range of ca. 1525 to 1625.

Several factors suggest that this site was used by Coronado. Of the seven 16th century Spanish entradas that passed through the area, only Coronado and Oñate brought along domesticated animals. A fair amount of time and energy were invested in excavation of these campsites. From the amount of

trash deposited and the interior hearths, it appears the camp was occupied in cold weather for a fairly long period of time. Crossbow bolts were found here. The use of the crossbow has been documented for the Coronado entrada. (It is unknown whether Oñate or other Spanish entradas used the crossbow.) Because Oñate camped along the Rio Grande for a very short time, and in the summertime, it is suggested that this site might have been associated with the Coronado expedition (Vierra 1989). This site is potentially eligible for the National Register.

LA187, Kuaua Pueblo (Bernalillo Vicinity, Sandoval County). Kuaua, thought by some to be Tiguex or Moho, is located at Coronado State Monument. Kuaua was excavated in 1934-36 in an attempt to determine whether Coronado had wintered there in 1540-41. This large pueblo had over 1,200 rooms, 3 plazas, and 7 kivas; its puddled adobe walls probably were several stories high. Kuaua was occupied from the 1300s to the early 1600s. This pueblo is best known for the frescoes painted on the walls of Kiva 3, in the south plaza. This kiva postdates the Coronado expedition, having been built somewhere around 1600 and abandoned not too long afterward. Kuaua may have been the pueblo besieged by Coronado's army in the winter of 1540-41. This site is listed on the National Register.

LA325, 500, 501, and 502, Unnamed pueblo ruins complex (Bernalillo vicinity, Sandoval County). First described in 1882, these sites were situated on the west bank of the Rio Grande some distance south of the ruins of Kuaua. Unfortunately, they have been obliterated by dumping and road construction. The ruins complex consisted of house mounds of adobe and rubble construction and enclosed plazas or courtyards.

LA384, Old Zia Pueblo (Zia, Sandoval County). Chia or Old Zia was described by the Spaniards as a fine, large pueblo of more than 1,000 two- and three-storied houses and eight plazas. Estimates of the population in A.D. 1540 range from 5,000 to 20,000 for the original five Zian towns together; by 1690 the population had dropped to less than 300. A mission and convent were built at Zia about 1610–1612. The Zians joined the Pueblo Revolt of 1680 but did not resist reestablishment of Spanish rule in 1681. In 1688 Zia strongly opposed the Spanish, and a year later Zia was attacked and 70 Zians were taken into captivity. A new town was built near Jemez by the survivors, but they soon returned to Zia. The old pueblo is surrounded by modern houses. Zia Pueblo is listed on the National Register.

The Coronado narratives describe a series of pueblos along the route between the Rio Grande Valley and Pecos. These pueblos are thought to have been the Galisteo Valley pueblos of San Cristobal, San Marcos, Galisteo Pueblo, and San Lazaro. The Galisteo complex retain a high degree of integrity because they have not been significantly disturbed by archeological excavation or vandalism.

LA80, San Cristobal (Galisteo vicinity, Santa Fe County). San Cristobal was an active pueblo during the period of Spanish exploration and early settlement, and the Spanish supervised the construction of a 17th century mission there. The American Indians of San Cristobal were major participants in the Pueblo Revolt of 1680. Abandoned between 1692 and 1696, the pueblo was never reoccupied. Today the remains include defensive works and ruins of the mission and the pueblo.

LA98, San Marcos (Galisteo vicinity, Santa Fe County). San Marcos is estimated to have been continuously occupied from about A.D. 1300 until it was abandoned during the Pueblo Revolt in 1680. A mission was established at the pueblo in the early 1600s, but the American Indians of San Marcos played a major role in the Pueblo Revolt. Mounds and wall remnants up to 6 feet high eroding out of the stream banks are the only remaining visible reminders of this site. This pueblo is on the National Register of Historic Places.

LA26, Galisteo Pueblo (Galisteo vicinity, Santa Fe County). Galisteo Pueblo may be even older than the other pueblos in this area, possibly beginning as early as the latter half of the 13th century. The site, tentatively identified as the Pueblo Ximena, was visited by the Coronado expedition in 1540. Renamed several times, the pueblo was known as San Lucas when visited in 1590 by the Spaniard de Sosa, and as Santa Ana when Oñate called there in 1598 while establishing mission districts. A few years later its name was changed to Santa Cruz de Galisteo, and a church was built there. The residents of Galisteo participated in the Pueblo Revolt. They moved to Santa Fe, where they remained until 1692, when the Spanish returned. Shortly after the turn of the century the pueblo, now known as Santa Maria, was reestablished with 90 Tano Indian residents. Disease and Comanche raids diminished the population, and the few remaining inhabitants moved to Santo Domingo in 1794. The site, consisting of eroded mounds, is listed on the National Register (state significance).

LA91 and 92, San Lazaro Pueblo (Galisteo, Santa Fe County). The eastern part of San Lazaro Pueblo (LA 91) lay abandoned at the time of the Coronado expedition to the area in 1540. The western part of the village (LA 92) continued in use during this time, only to be abandoned in the 1600s. The east ruin was reoccupied by the late 16th century, and the Spanish supervised construction of a chapel that was a visita of the mission at Pueblo San Marcos. The inhabitants participated in the Pueblo Revolt of 1680, and sometime between 1680 and 1692 they abandoned the village and moved to a new location near present-day Santa Cruz. The site consists of a ruined wall and mounds and depressions associated with two pueblos and a mission church. Part of the site is privately owned; the rest is on Bureau of Land Management property. San Lazaro was designated an NHL in 1964.

KANSAS

14RC5, Malone site (Lyons vicinity, Rice County). This Great Bend Aspect site, consisting of mounds and clustered depressions, has been impacted by soil conservation and cultivation activities. Southwestern ceramics dating between 1450 and 1700 were found here, as was a unique pipe, possibly from the Pecos area. The National Museum conducted limited tests at Malone in the 1940s, and the site was placed on the National Register in 1972.

14RC301, Saxman site (Saxman vicinity, Rice County). This large village site of the Great Bend Aspect contained many grass-covered lodges and associated storage pits with numerous artifacts, including various Southwestern ceramics dating between the 14th and 18th centuries. On at least two occasions, fragments of European chain mail were found in storage pits in direct association with Great Bend Aspect materials. This site was added to the National Register in 1976. Now totally under cultivation, the site has been extensively dug by collectors.

14RC2, Majors site (Lyons vicinity, Rice County). The Majors site is on a low ridge near the Little Arkansas River. Cultivation has leveled the small mounds that marked the site. Several examples of chain mail were recovered from this Great Bend Aspect site by a local collector. Portions of the site excavated by the University of Kansas yielded glazed ceramics from the Rio Grande area, which may allow determination of a cultural chronology within the Great Bend Aspect.

14RC3, Kermit Hayes Site No. 1 (Lyons vicinity, Rice County). Present-day agricultural activities have caused impacts on much of this site, which consists of low mounds on a long ridge. Chain mail, a grooved maul, and other unique artifacts were found at this site by the landowner.

14RC8, Tobias site (Lyons vicinity, Rice County). One of the most important protohistoric sites in Kansas, the Tobias site contained many low, inconspicuous mounds and small depressions marking the locations of subterranean cache pits. The arrangement of these features creates the council circles, which are described as forming an aiming point for the solstice. Ceramics found at Tobias include various glazed sherds from the Southwest dating from the 13th through 17th centuries. Metal objects of Euro-American manufacture include rolled tubular copper or brass beads, a double-pointed awl, and an ax blade. Blue glass beads and a necklace of glass, turquoise, and bone also were found here. The site received selective excavation by the Smithsonian and the Kansas State Historical Society. The state of Kansas purchased this site in 1981. The overall plan for the site includes construction of interpretive and research centers; the site itself would be kept as a scientific preserve.

14RC9 and 14RC12, the C. F. and Paul Thompson sites (Lyons vicinity, Rice County). Refuse mounds and cache pits at the C. F. Thompson site were excavated by Smithsonian researchers, who located glazed Southwestern ceramics of the A.D. 1475–1650 period, incised puebloan pipes, and iron chain-mail fragments in direct association with aboriginal remains. A council circle was excavated at the Paul Thompson site by the Smithsonian in 1967. Next to the Tobias site, the Paul Thompson site remains the largest preserved site in the Lyons vicinity. Portions of both sites are still in uncultivated pastureland. Despite disturbance by collectors, these sites retain the potential to yield a great deal of scientific information.

14RC13, Kermit Hayes no. 2 (Lyons vicinity, Rice County). Although all surface features have been erased by cultivation, this site originally contained one of the largest and most perplexing circles found in the Great Bend Aspect sites. Burials were found here as well.

14RC14, Taylor site (Lyons vicinity, Rice County). Now in pastureland, this village site was completely cultivated and agriculturally terraced, a process that eradicated surface features. The 30-acre site is situated on the high ground of a ridge paralleling a floodplain. It may be an extension of 14RC3.

14MP1, Paint Creek Site (Linsborg vicinity, McPherson County). J. A. Udden found chain-mail armor and glass trade beads at the Paint Creek site in 1881. This site was originally described as 22 low mounds littered with potsherds and lithic debris. Covering an area of about 30 acres, the site also includes a council circle. Southwestern potsherds found at Paint Creek are datable for the 16th century. Some formal excavation was done in the mid-1930s by the Nebraska State Historical Society. Collectors have done extensive surface gathering and digging at Paint Creek.

14MP301, Sharps Creek Site (Lindsborg Vicinity, McPherson County). One of the northernmost and biggest of the Great Bend Aspect sites, the Sharps Creek site is noted for its large ceremonial circle. This relatively undisturbed site has great potential for yielding important information.

It is possible that Coronado's return route passed over what would later become segments of the Santa Fe Trail in Kansas, Oklahoma, and New Mexico, because both routes apparently followed earlier American Indian trails. Sites related to the Santa Fe Trail are discussed in the *Comprehensive Management and Use Plan* for the Santa Fe National Historic Trail; they will not be enumerated here.

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